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COMPUTERWORLD

IBM router preview may freeze market

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — IBM finally tipped its hand last week concerning the multiprotocol router it has long been rumored to have on the drawing board.

While IBM said it hoped to give the industry a sense of its router direction, analysts said the firm intended to freeze the rapidly growing market and steer buyers away from competitors, an accusation that has been directed at IBM often during the past three decades.

Beta testing will begin in a few months, and product availability will be announced within six months, said Jon Fjeld, product manager for network routing systems at IBM's Research Triangle Park, N.C., facilities.

Speaking during a teleconference originating here, Fjeld

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Bank merger puts IS on chopping block

BY CLINTON WILDER
CW STAFF

SAN FRANCISCO — Thousands of information systems jobs in several Western states could be axed in the next few months as Bankamerica Corp. and Security Pacific Corp. combine their IS operations to complete the largest merger in U.S. banking history.

Observers said they expect Security Pacific to feel the brunt of the consolidations, as Bank of America will retain its name and most of the executive control. Bank of America Executive Vice President Martin A. Stein will be the combined bank's IS chief, leaving doubt as to the future of John P. Singleton, who heads Security Pacific Automation Corp., the Los Angeles-based bank's IS subsidiary.

A source close to Security Pacific said Singleton plans to leave the bank. Singleton was out of the country last week and could not be reached for comment. Security Pacific employees refused to comment on merger-related questions. Stein was also unavailable for comment.

Molding the two biggest Western banks into one will cost between 10,000 and 20,000 people their jobs, with a significant number expected to come from the IS area. The banks said they plan to save $1 billion during the next three years from operational consolidations, and published estimates said $400 million of that sum would come from systems and operations. Southern California is expected

Continued on page 84

California gold rush

The Bank of America/Security Pacific Corp. megamerger would combine two giant IS operations

Bank of America
Top IS executive: Martin A. Stein
Fiscal 1990 revenue: $12.3 billion
1991 IS budget: $522.8 million
Total IS staff: 4,800
Data center processor value: $109 million
Number of PCs and terminals: 36,500
1990 *CW Premier 100* industry ranking: 7th

Security Pacific Corp.
Top IS executive: John P. Singleton
Fiscal 1990 revenue: $10.4 billion
1991 IS budget: $438.9 million
Total IS staff: 6,100
Data center processor value: $125 million
Number of PCs and terminals: 34,000
1990 *CW Premier 100* industry ranking: 5th

Source: *CW Premier 100* research

CW Chart: Michael Siggins

Users afloat in sea of Windows tools

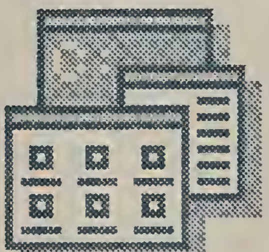
Vast array of choices has buyers looking hard at features, vendor stability

BY CHRISTOPHER LINDQUIST
CW STAFF

Be careful what you ask for; you just might get it.

That is the case for some Microsoft Corp. Windows 3.0 developers, who are finding that their pleas for more programming tools have been met with a recent flood of products. Users say they are now choosing carefully, with an eye toward balancing ease of use with power, and are looking for vendors that will be around for the long term.

The number of Windows development tools has leapt from a meager 10 or so to more than 150 with the advent of Windows 3.0, according to Jesse Berst, publisher of the newsletter "Windows Watcher."



The tools run the gamut from simple-to-use — although functionally limited — applications developers such as Borland International, Inc.'s Objectvision to powerful but complex tools such as the C language and Microsoft's Software Developer's Kit, or SDK.

Other less comprehensive tools, including screen painters and dialog and icon editors, are also pouring into the market.

The embarrassment of riches is giving users the luxury of looking for a closer match between products and their needs.

"It's got to be easy to use," said Ted Savas, a systems analyst at Cox Enterprises, Inc. in Atlanta. "If it's going to be for Windows, a good integrated environment is good to have."

Experts said vendor stability is also a factor. Many small firms are getting into the Windows development market, and there is no guarantee they will be around to support the products in the future. "Clearly, a shakeout is going to happen," Berst said.

Stability is important to Savas. "Borland's not going to go away," he said, adding that his

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DASD satisfaction

COMPUTERWORLD BUYERS' SCORECARD

What is your overall satisfaction with this product?
See Buyers' Scorecard, page 56

Response base: 30 users per product (20 for HDS' 7390)

Product	Score*
Hitachi Data Systems Corp.'s 7380	9.3
HDS' 7390	9.2
Amdahl Corp.'s 6380	9.0
IBM's 3390	8.3
IBM's 3380	8.3

*Ratings are based on 1-to-10 scale where 1 is very poor and 10 is very good

CW Chart: Janell Genovese

AD/Cycle revival bid targets old programs, new methods

BY ROSEMARY HAMILTON
CW STAFF

With AD/Cycle still stuck in low gear, IBM is planning a major expansion of the applications development initiative it announced nearly two years ago.

Last week, company officials said IBM will expand AD/Cycle beyond its computer-aided software engineering focus to provide tools to better maintain existing Cobol applications. The company also plans to branch out to newer development methods, including object orientation, and incorporate them as AD/Cycle options.

These steps come at a time when AD/Cycle is considered by industry observers to be only a modest success. While many customers use individual AD/Cycle CASE tools, the integrated tool set environment IBM heralded two years ago is not yet available.

Outgrowth of plan

IBM officials said last week that the various AD/Cycle expansion efforts do not signal a retreat from CASE (see story page 10). Instead, they said, these initiatives are an outgrowth of the original plan to include multiple development efforts under the AD/Cycle banner.

Industry observers contacted last week said that if IBM follows through on these new AD/Cycle directions, then it is finally realizing that CASE alone will not satisfy its customers' requirements.

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CA is making another acquisition move, announcing an agreement in principle for On-Line Software. Page 83.

Portable PC prices may jump as a result of antidumping penalties imposed on Japanese screen makers. Page 6.

Computer services tax in Pennsylvania draws wrath of users and vendors. Page 4.

In Depth — Taking advantage of cooperative processing. Page 61.

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Quotable

> *"This is a very clear case that an employee gave false information to someone and cost us a lot of money."*
>
> ROBERT STARER
> COMPUTER DYNAMICS
>
> *On the SPA's piracy hot line. See story page 8.*

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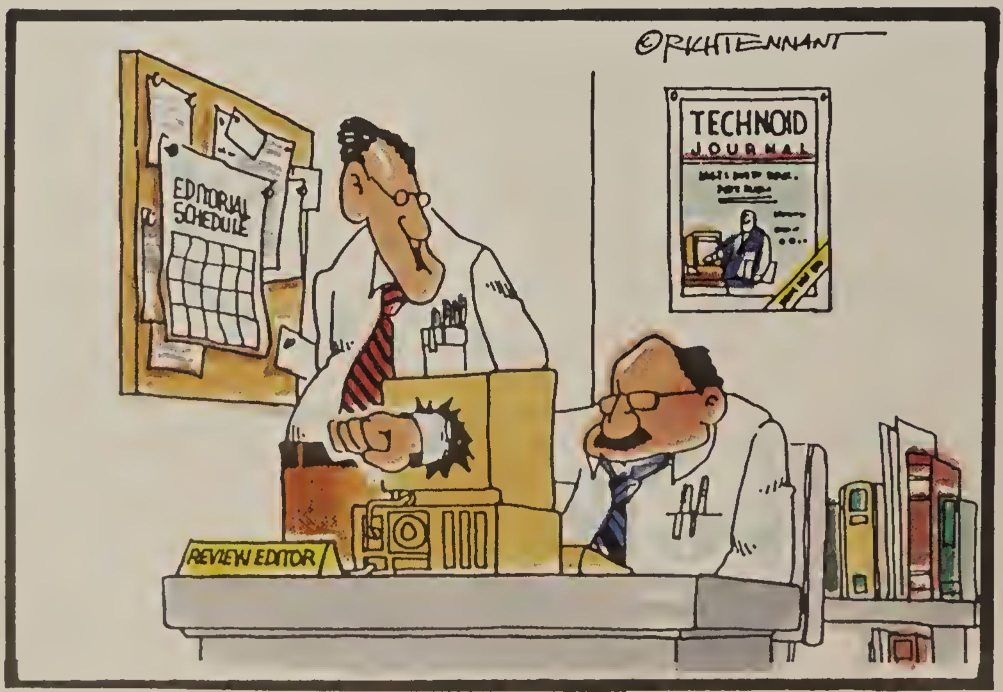


"DO YOU WANT ME TO CALL THE COMPANY AND HAVE THEM SEND ANOTHER REVIEW COPY OF THEIR DATABASE SOFTWARE SYSTEM, OR DO YOU KNOW WHAT YOU'RE GOING TO WRITE?"

EXECUTIVE BRIEFING

■ **The impending Bank of America/Security Pacific merger** — the biggest in U.S. banking history — will ax thousands of IS jobs. It could also make an IS powerhouse out of Bank of America. **Page 1.**

■ **Cooperative processing nirvana is about 10 years away.** But even though not all the pieces of a full-fledged cooperative processing environment are in place, IS can take advantage of what is possible now, laying the groundwork for the future. **Page 61.**

■ **Software developers get a peek into Microsoft's Windows 3.1**, an upgrade that includes a new set of anticrash diagnostic tools, a suite of dialog boxes that can be called and popped into applications and a slew of features that are aimed at improving applications integration. **Page 84.**

■ **Pirated software may find its way into organizations** unbeknownst to IS managers. Some vendors don't own the software they're selling and, therefore, don't have the right to pass on the license. **Page 76.**

■ **The International Trade Commission meant to protect** the endangered U.S. display market when it fined a group of Japanese companies for dumping flat-panel displays on the U.S. market. But the ITC's helping hand could deal a backhand blow to the thriving laptop market, which uses the Japanese displays. **Page 6.**

■ **Is the SPA acting too quickly and carelessly** in its raids on suspected software pirates? One recently raided firm says yes and cries foul. **Page 8.**

■ **Software developers join forces in an attempt to kill** a pending New Jersey bill that seeks to license their practice. **Page 4.**

■ **The IRS'** plan to launch a nonprofit organization to aid in its $8 billion tax system overhaul is rousing the ire of computer software and service firms that feel they've already got what the IRS wants. **Page 8.**

■ **It's a printer; no, it's a copier; no, it's a fax machine.** Actually, it's all three — and industry analysts expect the multifunctional devices to tear down the walls between the three market niches and trigger a major shakeout in the newly defined market. **Page 29.**

■ **Moves to expand its AD/Cycle strategy** signal no retreat from CASE, IBM says. **Page 1.**

■ **NCR is getting back to its pre-AT&T-acquisition business:** rolling out the Unix-based System 3000 line. As his crew builds the top two models, engineering and manufacturing general manager Michael Lambert is also busy paving ways for customers to migrate to them. **Page 25.**

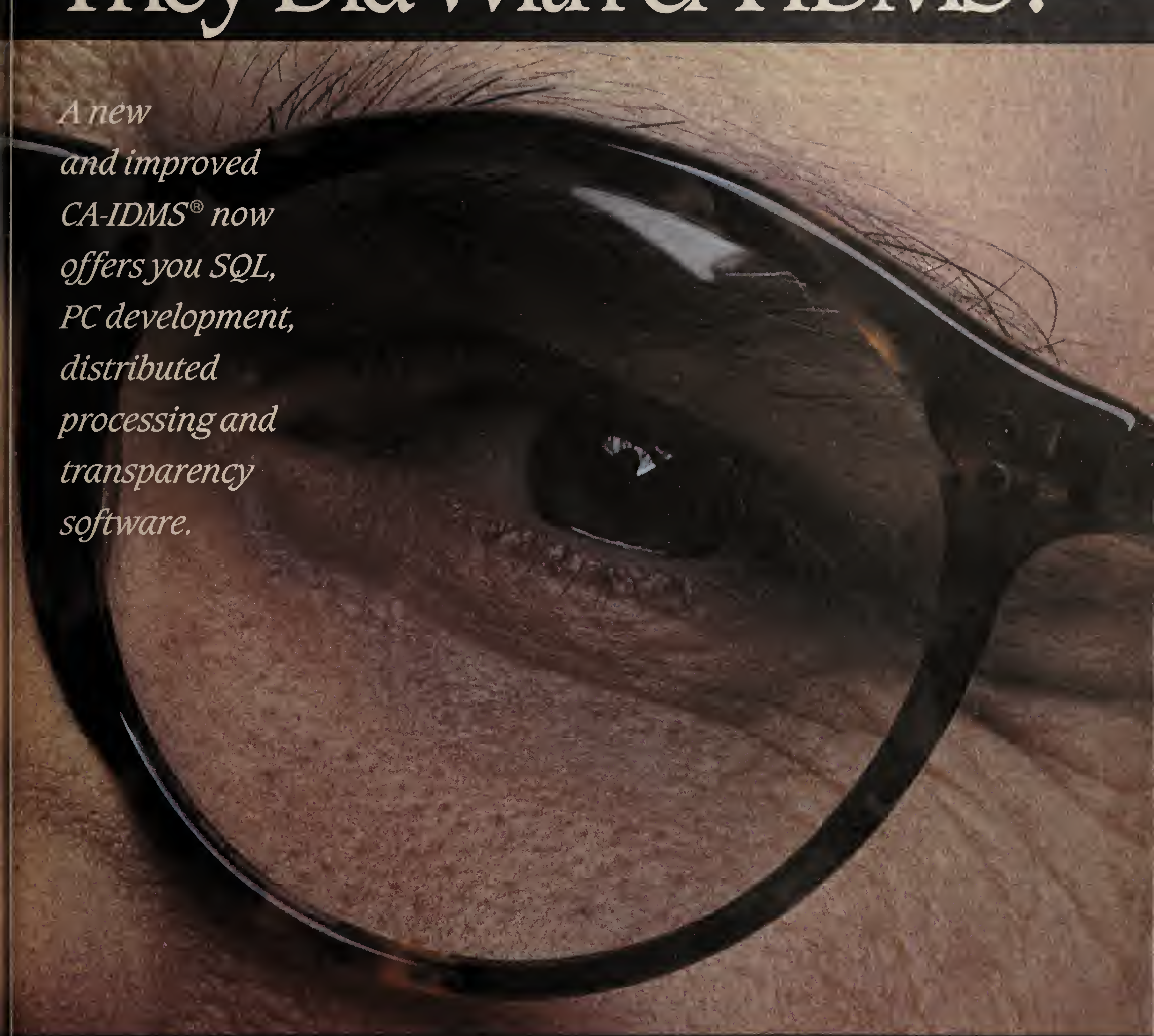
■ **IBM's router direction** is now on the firm's official map: a homegrown, RISC System/6000-based router family will ship to beta-test users within the next few months. IBM is parting with protocol and preannoucing the routers in an attempt to freeze the market, analysts say. **Page 1.**

■ **Prices for storage hardware fell 60% to 70% during the 1980s;** unfortunately, storage management costs didn't take such a drop. In fact, it costs five times more to manage storage than to purchase it, according to New Science Associates, a consulting group in Stamford, Conn. **Page 51.**

■ **Affordable handheld optical character recognition scanners** used to be an IS manager's pipe dream and a developer's nightmare. Now they are Caere Corp.'s latest product line. **Page 31.**

■ **On site this week:** Two years ago, New York-based international trading firm London & Bishopsgate International, Inc. was a start-up whose computing resources were a PC and a printer, both of which were secondhand. Today, LBI is a 50-person outfit with some $500 million under management and a full-tilt IS department whose DEC VAX and stable of workstations are about to be networked. IS head JoBette McCann led the transition. **Page 23.**

"Have You Seen What They Did With CA-IDMS?"



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Computer services tax unwelcome in Pa.

BY CLINTON WILDER
CW STAFF

Computer services in Pennsylvania will cost more starting Oct. 1, and neither vendors nor users are happy about it.

The overdue state budget recently passed by the Pennsylvania legislature will extend the state's 6% sales tax to a wide range of computer services, including contract programming, software development and facilities management, as well as non-computer-related services.

"We spend millions a year on these services, and I am very concerned about the impact on our bottom line," said Robert Rubin, vice president of information services at Atochem North America, a Philadelphia-based subsidiary of French chemicals giant Atochem SA. "I'm not sure the Pennsylvania legislature recognizes what the potential impact will be."

The bill imposes a sales tax on six categories of computer services: programming, systems design, processing, information retrieval, facilities management and other services including disk and tape conversion, software installation and database consulting.

While users feared the information systems budget impact, services vendors said the tax will hurt their competitive position against out-of-state vendors — particularly in a state whose two major metropolitan areas are near state borders. "If a firm in Princeton, N.J., or Wilmington, Del., can deliver the same bang for the buck, the customer now has a 6% reason not to go with us," said Gregory Barsh, vice president at Seca, Inc., a software development consultancy in Conshohocken, Pa. "It is depressing."

Pennsylvania companies that have outsourced IS operations to Pennsylvania-based vendors may be hit particularly hard. "I certainly don't like to hear something like this," said Bill Morgan, vice president of IS at Copperweld Corp. in Pittsburgh. Copperweld outsourced processing several years ago to The Genix Group, also based in Pittsburgh.

"In addition to Genix, we use a lot of contract programmers," Morgan added. "It's going to be a lot of money. I wonder if they could be chasing people out of the state."

That sentiment was echoed by several vendors. "The Philadelphia area is billing itself as the highest growth high-tech area in the country, and this is like shooting yourself in the foot," said Dudley Cooke, president of Executive Insight Group, Inc., a consultancy in Bryn Mawr, Pa.

The bill imposes an additional 1% city tax on services delivered in the city of Philadelphia.

Deficit control

Pennsylvania suffers from a $3 billion state budget deficit, and the tax on computer services is part of a package that taxes services encompassing lawn care, pest control and pizza delivery. The bill was passed earlier this month after the state went for more than a month without a budget.

"It was never heard in committee, and there was no public debate," said Mitchell Gorsen, vice president of information technology services at Adapso, the Arlington, Va.-based software and services industry association. "It is shortsighted, regressive and antitechnology."

Gorsen said Adapso will lobby for a repeal, but the legislature has adjourned, and the tax will take effect Oct. 1.

Contradiction in tax

While only a few states tax custom software, all but a few tax packaged software

Those that tax custom software

- Arkansas
- District of Columbia
- Hawaii
- Maine
- Mississippi
- Nebraska
- New Mexico
- South Carolina
- South Dakota
- Tennessee
- Texas
- West Virginia

Those that don't tax packages

- Alabama
- Alaska
- Delaware
- Montana
- New Hampshire
- Oregon

Source: Adapso

CW Chart: Janell Genovese

N.J. licensing proposal draws user opposition

BY JOHANNA AMBROSIO
CW STAFF

TRENTON, N.J. — Fearful of costs and other factors, some information systems managers are banding together to oppose a bill that would require software developers to be licensed.

The bill proposes that software designers in New Jersey be licensed by passing a test, among other criteria. Included as designers are people who design, specify, implement, test, validate, operate, maintain and manage software. While the bill exempts federal employees, some observers said its language is broad enough to include everyone else in the state who fits those job descriptions [CW, July 15].

Although fees have not yet been specified, an AT&T spokeswoman said the company has estimated the cost to be between $200 and $300 per employee. That figure includes the fee, training costs and missed time from work.

Senate fight ahead

The bill passed the New Jersey Assembly on June 27 but still has to pass the Senate. Indications are that the bill may die quietly in a Senate committee.

Some IS managers are fighting to make sure that happens. Omicron, a Mountain Lakes, N.J., consortium of IS executives from approximately 60 companies, is leading one charge by organizing users and soliciting IS opinions about the bill. In addition, Omicron President James H. Webber wrote a letter to Gov. James Florio and legislators asking that they disavow support for the bill.

Webber called the bill a "covert revenue-raising, bureaucracy-building boondoggle" and said it would affect more than 100,000 employees in more than 3,000 organizations.

Individual IS executives are also trying to stop the bill from becoming law. John Shiels, vice president of information services at JM Huber Corp. in Edison, N.J., said, "We're joining Omicron's efforts, and I've talked to our corporate lobbyist and asked him to do what we can do to stop it."

Shiels said he is concerned about several possible ramifications of the bill, including the cost of getting all of his employees licensed and the impracticality of an examination that purports to test all software disciplines across the board.

"The technology changes so rapidly that what makes sense today may not make sense next year," he said. "And just because you pass the test this time, that's no guarantee that you'll pass the next time around." He added that it will "drive up the cost of continuing to do business in New Jersey, and it will be another reason for companies to leave the state."

"We see little or no value in the bill. I think it's somehow a money-making operation for the state," said John O'Brien, vice president of applications development at Mersk Data USA.

He added that the bill's language is confusing. "Some of our people come from New York; do they also have to be certified?" he asked.

Another group — Netsu of New Jersey, Inc. in West Caldwell, which comprises midrange systems users — raised the topic at two recent meetings to gauge members' reaction.

"We're taking a stand against it," said Steve Krozser, Netsu's president. "We hope the bill is soundly defeated."

Birth of a bill

Cynics who say one person cannot make a difference have not met Peter Z. Ingerman, an independent systems consultant in Willingboro, N.J. It was largely through his efforts that the bill now raising such a ruckus in New Jersey came into being.

It all started on June 21, 1990, with a letter from Ingerman to Assemblywoman Barbara Kalik. Ingerman said he suggested that the state recognize the status of software engineering, as it has recognized professional engineering, by establishing some sort of certification process.

"I can't tout myself as a software engineer," Ingerman said. "The Professional Engineering statutes say that I cannot represent myself as any kind of engineer unless I'm a licensed P.E. Yet it seems to me that I have some competency in software engineering, and it is how I make my living."

Ingerman said he received a reply from Kalik on June 26, 1990, saying that she would look into the matter. The next he heard from Kalik's office was a draft of the bill when it was introduced in January 1991.

Appearing before Kalik's committee hearing in June, he expressed reservations about the bill's language. "I'd hoped that the state would establish a way to recognize people who chose to be certified, not mandate that everyone would have to be."

JOHANNA AMBROSIO

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201/967-1350
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Washington, D.C.
Mitch Betts, National Correspondent
(202) 347-6718
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Box 9171, 375 Cochituate Road
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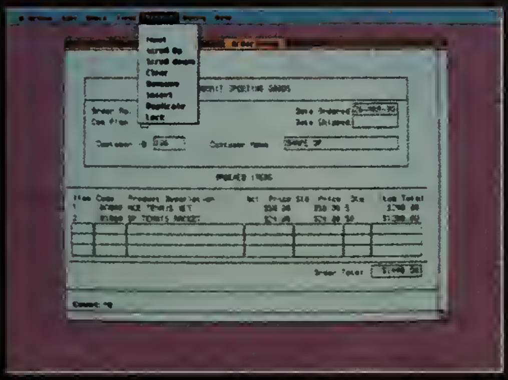

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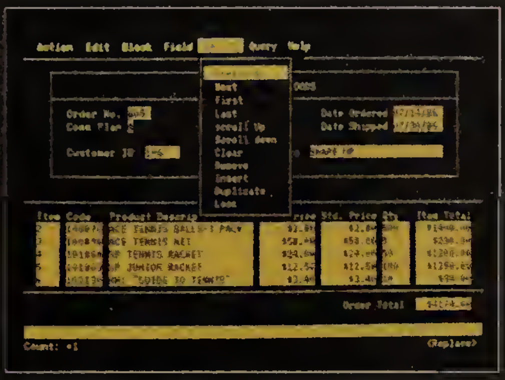

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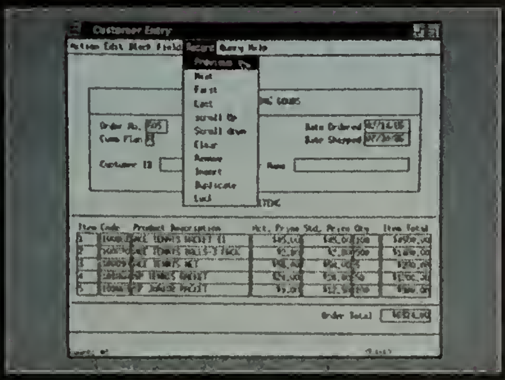

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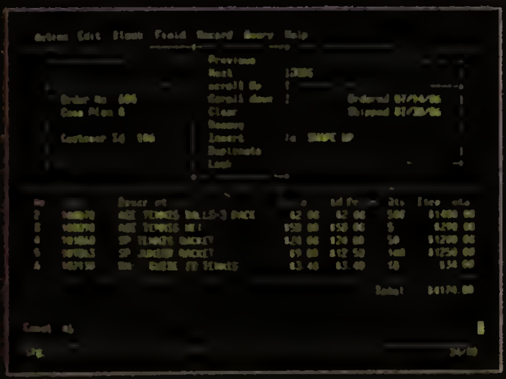

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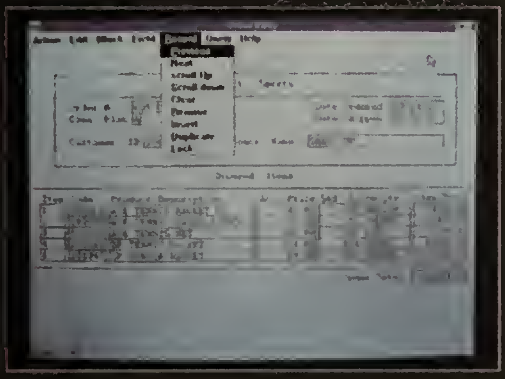

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Novell tackles naming update

Problems require big changes to Netware operating system, sources say

BY JIM NASH
CW STAFF

Major changes to Novell, Inc.'s Netware operating system may be needed to accommodate the needs of network managers frustrated by the current version of Netware's naming service, according to sources close to the company who requested anonymity.

The changes, the sources said, will include revisions or additions to Netware's bindery and are not expected to be shipped for 18 months. Some users said the wait for an update is forcing them to add personnel to handle what are essentially clerical administration tasks.

Some managers of large networks said they do not plan to use the current version of Novell's naming service. Instead, they are manually compiling lists of users and resources.

Almost from the day it was shipped in January, Novell's domain-based directory, or naming service, has been under fire from many Netware network managers and industry observers [CW, Jan. 28]. Critics contend the service is sluggish when handling large numbers of users and requires too much human intervention.

The sources said the Provo, Utah-based networking company is likely to introduce the new naming service to developers a year from now, possibly as part of an upgrade to Netware itself. It may be spring of 1993 before the product ships, they said.

A sophisticated naming service is an important feature for managers of large networks who must connect end users across entire companies without having to set up point-to-point communications.

Novell: No big rewrites

Gerry Machi, director of marketing for Novell's communications products, said the company is working on improvements to its naming services but also said the upgrade will not require major rewrites to Netware or the bindery. He would not comment on when an upgrade would be available.

However, sources outside Novell who are familiar with Netware said the company will have to significantly add to or revamp its network bindery. The bindery is a list-type database on each server containing user names, logon security rights and other information.

Using a telephone analogy, users today can dial directly to any other user or service within their own logical group or domain. A domain can be everyone in the accounting department or all users on an office floor, for example. To contact someone outside a user's assigned domain is considerably more complex.

Novell will have to alter or add to the existing bindery, the sources said, in order to make a naming service that can connect users and resources anywhere on a network. Novell also needs to allow Netware to connect more than eight servers simultaneously, they said.

Network managers agreed that a naming service capable of coordinating the operations of all users and resources on an entire network is overdue.

"Other naming services need less administration," said David Ellerbe, manager of departmental processor support at Coca-Cola Foods, Inc. in Houston. Even within domains, Ellerbe said, it takes "forever to synchronize the [binderies] and update them."

"Many of the companies that have big networks have developed their own work-arounds" for administrative hurdles, said John Moyle, leader of a Sacramento, Calif., Netware user group.

Nancy Raley, director of office information systems at Calfarm Insurance Co. in Sacramento, said she is hiring new network engineers just to keep track of users and resources and the access rights that are assigned to them.

Wang breathes life into low end of VS family

BY SALLY CUSACK
CW STAFF

Reinforcing its commitment to keep enhancing its VS minicomputer line, Wang Laboratories, Inc. unveiled a low-end system last week targeted at small-business users and departmental computing environments.

The VS 6000/Server is meant to function as an application server platform to "help users step along the path toward open platforms," VS product line manager David Strohmeyer said.

Wang said it expects many customers to migrate to client/server environments in the future. To that end, Strohmeyer said, the company will continue to enhance the server capabilities of the VS to help customers migrate applications to IBM RISC System/6000 platforms.

While Wang currently offers Open Server, which allows VS users to hook the VS into a personal computer local-area network environment, the company also plans to port its imaging technology, database software and office automation products to the RS/6000 platform. A Wang spokeswoman said users could expect ports for these products in a few months.

Matthew J. Gillman, president of the U.S. Society of Wang Users, said VS users seemed more interested in integrating their midrange systems with LANs than in moving them to the IBM Application System/400 computer — a migration strategy resulting from the recent Wang/IBM alliance.

Priced from $11,500 to more than $125,000, the VS 6000/Server will replace the VS 5000 offerings. Strohmeyer said VS 5000 machines will still be manufactured to "fulfill contractual obligations."

The proprietary line now consists of the low-end VS 6000/Server, the midrange VS 8000 series and the top-of-the-line VS 10000.

Life at the low end

Wang Laboratories, Inc.'s VS 6000/Server is positioned as an interim step to open systems

- Based on 32-bit CMOS technology.
- Supports up to 256 users.
- Peer-to-peer I/O bus with 20M byte/sec. transfer rate.
- Four standard cabinet models available.

The Wang VS 6000/Server

Source: Wang

Hammitt departs United Technologies

HARTFORD, Conn. — The future of information systems leadership at manufacturing giant United Technologies Corp. is in question after the departure of John Hammitt, vice president of IS, earlier this month.

Hammitt, 47, resigned Aug. 5 under less than amicable circumstances, according to sources. "I'm not disappearing, I'm simply going to pursue new opportunities," Hammitt said from his Connecticut home last week. He refused any further comment on his departure.

Among Hammitt's projects at the $22 billion conglomerate was consolidating data centers of the firm's many large business units, including Otis Elevator, Inc., Sikorsky Aircraft and Hamilton Standard Co. Sources said the consolidation project is running behind schedule and over budget, although it was unclear if Hammitt's departure was related to that.

"I liked John, and I'm going to miss him," one United Technologies IS employee said.

John Rolls, the firm's executive vice president and chief financial officer, will head IS on an interim basis, but a spokesman said it is not yet clear whether United Technologies will hire a successor to Hammitt or possibly restructure the job.

The company formed an IS advisory committee that includes Paul Pace, director of financial planning.

Hammitt, a highly visible IS executive, joined United Technologies from Pillsbury Corp. in 1988. He served as president of the Society for Information Management (SIM) in 1988-89.

The past three SIM presidents have changed jobs in the last year. Current President John Owens moved from Sara Lee Corp.'s Hosiery Division to Carrier Corp. last year, and previous President Laurance Burden resigned from S. C. Johnson & Son, Inc. at the beginning of this year.

CLINTON WILDER

U.S. slaps steep penalties on Japanese flat-panel displays

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In an effort to aid the fledgling U.S. flat-panel computer display industry, the U.S. International Trade Commission (ITC) has dealt a harsh blow to the fastest growing segment of the U.S. computer industry: makers of laptop and notebook computers.

The ITC found that Japanese-made displays imported at less than fair price are harming U.S. competitors and imposed a 63% surcharge on the offending imports. The fined wares, however, include the type of displays increasingly used in second-generation computers.

The action may lead to higher prices for laptop and notebook computers in the U.S., and it is likely to send U.S. computer assembly operations overseas, industry executives said.

The ITC also imposed import penalties of 7% on the electroluminescent displays used in rugged military computers. In accordance with an earlier finding by the U.S. Department of Commerce, the ITC imposed no dumping penalty on imports of the passive-matrix LCDs commonly used in first-generation portables. The penalties will kick in later this week.

Apple Computer, Inc. buys the kind of display subject to the 63% penalty — called active-matrix LCDs — from Japan's Hosiden Electronics Co. for its laptops assembled in the U.S. James Burger, senior trade counsel for Apple, said the company will most likely now move the U.S. operation to Singapore or to Cork, Ireland, where it already has facilities.

He said the screen represents between 20% and 30% of the computer's total cost, so a 63% increase in the display's price would hike total costs by more than 12%.

Burger declined to speculate on how a move offshore might affect the price of its laptop and notebook computers, but he said it could result in increases if Apple's costs increase.

In a terse statement, IBM called the ITC's action "an eviction notice from the U.S. government to the fastest growing part of the U.S. computer industry." IBM and Toshiba Corp. set up a joint-venture facility in Japan for making the active-matrix LCD, and IBM's imports from that plant would now be subject to the new penalty. IBM would not comment further on the ITC action.

The antidumping petition was brought on by a coalition of small U.S. display makers who said they were being harmed by unfair Japanese competition.

Prime to cut work force by 900

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Plunging sales of its proprietary minicomputers will force Prime Computer, Inc. to cut 900 employees — about 11% of its work force — by the end of the year.

Harvey Wagner, Prime's chief financial officer, said most of the employee reductions would be implemented internationally, with the heaviest hits expected to occur in the Canadian and Australian operations. Prime gets 60% of its revenue outside the U.S.

The company has already reduced its work force by 800 people this year.

Product revenue for the traditional minicomputer Computer Systems Business Unit skidded 42% in the second quarter, compared with the corresponding quarter in 1990. By contrast, sales in the Computervision line were down 9%.

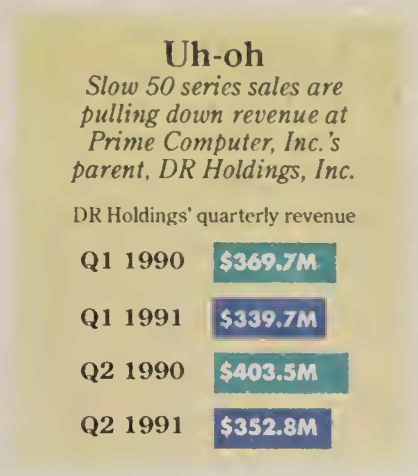
With its traditional minicomputer business dying, Prime has made no secret of the fact that it is putting most of its muscle behind its Computervision business unit. Computervision currently accounts for almost 80% of the firm's revenue.

Prime's layoff is not that big considering the size of the loss, said William Sines, director of midrange systems and server research at Technology Investment Strategies Corp. in Framingham, Mass. He said that unless the sales drop is reversed, additional cuts could be expected.

Russell E. Planitzer, chairman of Delaware-based DR Holdings, Inc., which bought Prime in a highly leveraged buyout in 1988, predicted that the traditional 50 series platform has about "five years left in it."

"My gut feeling is that the 50 series' future has been shaky since the buyout," said Vic Kaaria, manager of technology support at Skyway Freight Systems, Inc., a $60 million, privately held company in Watsonville, Calif.

Skyway has been a loyal Prime user since the early 1980s, Kaaria said, but now sees its high-end 50 series boxes as a "reliable patch" while it evaluates Unix vendors, including Prime.



Analysts and users said they give Computervision's computer-aided design and manufacturing products high marks: The company ranks with IBM and Intergraph Corp. as a major player in the U.S. market.

DR Holdings reported a second-quarter loss of $349.7 million, compared with $36.2 million in the same period last year.

The firm attributes the unfavorable loss to declining 50 series sales along with the strengthening U.S. dollar abroad.

Borland aims at low-end use

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International, Inc. diverted its energies from the corporate customer last week when it announced inexpensive, stripped-down versions of its flagship Quattro Pro spreadsheet and Paradox database that are aimed squarely at the home and small-business markets.

The move is typical of Borland, which blossomed through its aggressive pricing policy and now competes furiously with firms such as Lotus Development Corp. to secure the entry-level customers that may one day need the full-featured products. "We're looking for the customer who is perhaps shopping around for their first spreadsheet or database," spokeswoman Catherine Miller said.

Both the $69.95 Quattro Pro Special Edition (SE) and $99.95 Paradox SE packages sport price tags that are hundreds of dollars lower than their full-featured DOS counterparts: Quattro Pro 3.0 costs $495, while Paradox retails for $795. Lotus' low-end spreadsheet, 1-2-3 Release 2.3, also carries a retail price of $495.

Although Quattro Pro SE has all of the analytical features of Quattro Pro 3.0, it lacks the interactive what-you-see-is-what-you-get (WYSIWYG) display that gives users control over the appearance of numbers, text and formatting. Users can, however, still do WYSIWYG screen previews.

The Paradox SE model is essentially a stand-alone version of the full-blown Paradox database with the Paradox Applications Language removed. Paradox SE also lacks some of the high-end development tools of Paradox but will retain support for relational database design and include a query-by-example utility.

Quattro Pro SE and Paradox SE are slated to begin shipping next month. Paradox SE will carry an introductory price of $69.95 through Sept. 30.

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NEWS SHORTS

Gupta plans introduction

Gupta Technologies, Inc. plans to announce a new version of its 3-year-old programmer productivity product, SQLwindows, this week. The new version, SQLwindows 3.0, supports team-oriented programming, generates reusable code and provides prompts for less-experienced programmers. The $1,295 package, scheduled for release next month, is a replacement for SQLwindows 2.0, released in November 1990.

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Avatar, Tri-Data merge

Merger mania continued last week as Avatar Corp. and Tri-Data Systems, Inc. — two of the leading lights in the Apple Computer, Inc. Macintosh-to-IBM mainframe connectivity world — announced a union. Avatar's absorption of Tri-Data creates a new powerhouse in that market segment by combining the firms' complementary 3270 connectivity offerings: Avatar's Macmainframe and Tri-Data's Netway.

. . . .

Telecom pros in demand

While many data processing professionals felt lucky to remain employed in 1990, telecommunications professionals were in high demand and got average salary increases of 5%, according to a 51-company survey by Edward Perlin Associates, Inc., a compensation consulting firm. Companies may be willing to put some systems development and maintenance projects on hold, but they will not permit any degradation of their critical networks, the New York-based firm explained.

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Borland sets up facts fax

Borland International, Inc. continued to work on smoothing out concerns about how its buyout of Ashton-Tate Corp. will impact the two firms' varied product lines when it recently established a fax line for puzzled users. Customers with questions about Borland's database product direction can fax their questions — one per fax — to (415) 989-5422.

. . . .

Microsoft eyes multiplatform DOS

Microsoft Corp. has acquired the license to a software emulation technology that will allow users to run DOS applications on all major operating system platforms. The software, which is produced by the British firm, Insignia Solutions, recreates the IBM Personal Computer AT environment and will be incorporated into future Microsoft product offerings.

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Stardent spins off AVS

Stardent Computer has spawned another brand name with the advent of AVS, Inc. The Concord, Mass., computer company is spinning off the fledgling firm to develop, market and support its Application Visualization System.

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Retailer drawn into vendor spat

The Burlington Coat Factory Warehouse Corp. has one suit it won't be able to discount. Dallas-based Visystems, Inc. last week hauled the clothing retailer into court on patent infringement charges based on Burlington's use of a Unix-based application migration tool kit that allegedly treads on Visystem's protected intellectual property turf. Visystems also filed suit against Bernardsville, N.J.-based Merchandise Management Systems, Inc., which supplied Burlington with the kit.

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IBM lowers XGA pricing

Hoping to make its Extended Graphics Array (XGA) graphics controller more attractive, IBM has reduced the price of the Personal System/2 XGA Display Adapter/A from $1,095 to $795. Prices on the PS/2 Video 512K Memory Kit dropped from $350 to $280. IBM also began shipping a 50-MHz Intel Corp. I486 Processor Upgrade Option for its PS/90 and PS/95 products. It will cost $3,695 to upgrade an I486/33-MHz system, $5,345 for an I486/25-MHz system and $7,245 for an I486SX/20-MHz system.

More news shorts on page 83

User charges SPA excess

BY KIM S. NASH
CW STAFF

VIRGINIA BEACH, Va. — The Software Publishers Association (SPA) has again dropped a software piracy suit against a user, but this time, the accused company is charging that the watchdog organization has gone too far.

Early this month, the SPA dropped all charges that Computer Dynamics, Inc. (CDI) had pirated 1,460 copies of several applications and used them in public training classes and daily operations. However, CDI, based here, agreed to pay the SPA $20,000 for unspecified "educational material" on software copyright law.

Robert Starer, CDI's chief executive officer, claimed he received no calls from the SPA to discuss the charges before being slapped with the suit March 1. "I think the SPA is a little bit out of control at this point," he said.

He also said the $20,000 payment was not part of any compensatory agreement that CDI signed with the SPA. "We proved that we were 100% clean, and [the SPA] just went away," Starer said.

However, the SPA disagreed. "Read between the lines," said Ken Wasch, executive director of the SPA, implying that if CDI were clean, it would have no reason to buy $20,000 worth of ambiguous educational materials.

One proved innocent

Of the nearly 100 lawsuits filed against U.S. companies by the SPA since it began operation in 1989, "only one case was dropped with no payment of any money for any reason. That was Snap-on Tools," Wasch said.

The SPA dropped its case against Snap-on Tools Corp. in May after a raid on the Kenosha, Wis.-based firm turned up no evidence of software stealing [CW, May 13].

The outcome of the CDI suit is not similar, Wasch said. "We decided that [CDI's] copyright violations were inadvertent, but we didn't say they didn't exist," he said.

The software in question included Novell, Inc.'s Netware, Microsoft Corp.'s Word, Windows 3.0 and MS-DOS, Lotus Development Corp.'s 1-2-3, Ashton-Tate Corp.'s Dbase and Wordperfect Corp.'s namesake word processor. Those five vendors were listed as plaintiffs in the suit.

Starer said that before the matter escalated to the point of facing a federal judge, the SPA attempted to persuade CDI to settle out of court by paying a "substantial cash settlement."

"I said, 'No way. You have impugned the integrity of my company,' " he explained.

The fracas began when an unidentified CDI employee called the SPA piracy hot line, advising the Washington, D.C.-based organization to check into alleged widespread software copyright abuse at CDI. While Starer said he is "satisfied" that his firm's name has been cleared, he questions how well the SPA checks out tips it receives.

"This is a very clear case that an employee gave false information to someone and cost us a lot of money," Starer said.

Between legal fees paid to a law firm hired to guide CDI through the case and time lost while CDI employees searched for original disks, purchase orders and invoices, CDI spent $110,000 to $120,000 to prove its innocence, Starer said.

He added that he does not know whether he will prosecute the employee, when or if he discovers who it is. Meanwhile, the SPA has pledged to keep secret the identity of the tipster. "It is absolutely our policy to protect informants," Wasch said.

IRS proposal worries government bidders

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Computer services and software firms are up in arms over a proposal by the Internal Revenue Service to establish a nonprofit organization that would assist in the agency's massive tax-system modernization.

They said the entity, the Federally Funded Research and Development Center (FFRDC), would siphon off some $100 million in contract revenue over five years and would waste taxpayer dollars by reinventing technology.

The IRS has proposed the FFRDC as a way to help it get its arms around its decade-long, $8 billion tax systems overhaul. "The FFRDC will operate at a relatively high level within the IRS, involving research, strategic planning, review, analysis and evaluation," the IRS said in a public notice.

The IRS has proposed that the FFRDC run for five years with renewable options at a cost of $20 million per year and with a staff of 30 to 90 people.

However, Adapso, the Arlington, Va.-based computer software and services industry association, said last week that the FFRDC would "remove important systems applications work from the competitive marketplace" as well as bypass existing government and industry technology. Adapso also said the nonprofit agency would allow the IRS to sidestep government procurement regulations.

The Vienna, Va.-based Professional Services Council (PSC) also weighed in against the plan, challenging an IRS assertion that the FFRDC is needed to avoid "vested or commercial interest in recommendations that may be made to IRS officials" and to ensure "objectivity and independence free from organizational, profit or market-related conflicts of interest."

Deborah Bugby, PSC's director of business/government policy, said the desire to ensure objectivity need not preclude contracting with the private sector. Most companies "would submit to very severe conflict-of-interest clauses because they do that all the time," she noted.

The IRS declined to comment.

In a letter to the IRS last week, Adapso recommended that the agency survey existing government, nonprofit and for-profit sources for the needed capabilities and enlist the aid of the private sector in applying them. Adapso also recommended scrapping the "impractical" conflict-of-interest provisions set forth in the IRS' public notice on the FFRDC.

In the spotlight

Segments of the computer industry fear that the IRS' Federally Funded Research and Development Center will infringe on their territory

The IRS wants the center to perform work in the following areas:

- Technology assessment and proof of concept.
- Strategic planning.
- Acquisition planning, review and evaluation.

The center would *not* be allowed to do the following:

- Perform routine "production" work readily available from in-house sources or contractors.
- Perform work for any federal agency other than the IRS.
- Hire subcontractors without IRS approval.

CW Chart: Janell Genovese

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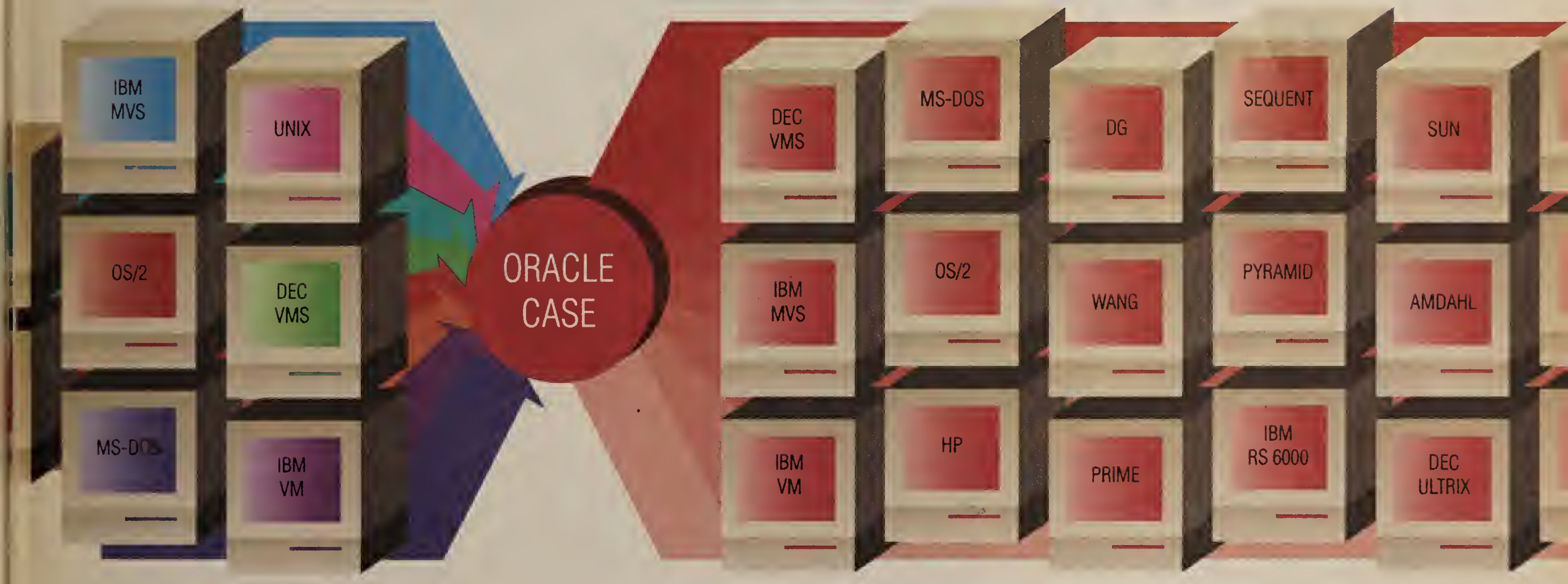

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AD/Cycle

CONTINUED FROM PAGE 1

"We would welcome with open arms any type of Cobol tools, especially on the maintenance side," said Neil Ferri, a vice president and group director of corporate data architecture at Merrill Lynch & Co.

Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass., said IBM has a tough job ahead as it tries to address the CASE core of AD/Cycle and other development issues simultaneously.

"We have to have a concern for how to move the older code forward," he said. "The fact is, the majority of businesses out there are still not on CASE."

In fact, a recent CSC Index, Inc. study found that only about one-quarter of the companies surveyed were using CASE.

Robert Libutti, director of market strategy at IBM's Programming Systems Division, said IBM had long planned to address Cobol and other third-generation languages (3GL) through the AD/Cycle strategy, and "we are probably at fault" for not communicating that plan.

"We have emphasized so much the new [CASE] element," Libutti said. IBM referred to a 3GL component of applications development when AD/Cycle was announced, but, Libutti said, "we are now going to be dealing with it in a very meaningful way."

Libutti would not provide a specific time frame, but he did say that IBM intended to introduce products as well as expand on an existing relationship with Micro Focus, Inc., which sells workstation-based Cobol tools.

"Replacing everything with new development wasn't really high on our list," said Roger Cousins, a vice president at the Information Systems Division of Manufacturers Hanover Trust Co. "Anything [IBM] can do that helps support the maintenance world or to re-engineer what we already have is a positive."

Cousins and other users said they were impressed with IBM's plan to address Cobol maintenance, but they said they were not quite as taken with the other AD/Cycle directions, which would address techniques more advanced than CASE.

IBM has an outstanding promise to deliver a statement of direction on how object-oriented techiques will fit into AD/Cycle. Last week, it announced a deal with Sapiens International that will allow it to co-market Sapiens' rules-based applications development environment.

Sapiens is not a strategic AD/Cycle partner, but the goal is to eventually tie its software into AD/Cycle's Repository Manager.

"We are demonstrating here that AD/Cycle can support more than your typical approach to applications development," said Tom Fisher, a manager of vendor relations at IBM's Programming Systems Division.

On tap for AD/Cycle

Robert Libutti
Director of market strategy at IBM's Programming Systems Division

Short-term plans:

- Demonstrate integration of business partner tools with Repository Manager.
- Introduce improved Cross System Product, with focus on the workstation.

Expansion plans:

- Address existing Cobol applications through maintenance tools from IBM and others.
- Add higher level development approaches such as the Sapiens rules-based system and object-oriented methods.

Photo: Andy Freeberg

CW Chart: Michael Siggins

CASE plans

While IBM is charting new directions for its users as part of the AD/Cycle strategy, it is also planning to improve the CASE component, a company official said last week.

To underscore this point, Robert Libutti, a director of market strategy at IBM, said the company has at least two plans for the AD/Cycle CASE strategy.

First, IBM AD/Cycle business partners will announce integration of their CASE tools with the Repository Manager component of AD/Cycle. Tool integration has become a nagging issue for IBM because little exists today, and it is central to the whole AD/Cycle strategy.

Second, Libutti said, there will be an effort to improve Cross System Product (CSP), which is IBM's strategic AD/Cycle code generator. The next step will be to deliver more functionality to a CSP version for the workstation.

Libutti did not provide time frames for these CASE-related moves. Industry observers said they expect AD/Cycle to be included in the large-systems announcement scheduled for next month, and the tool integration and CSP improvements could also be included.

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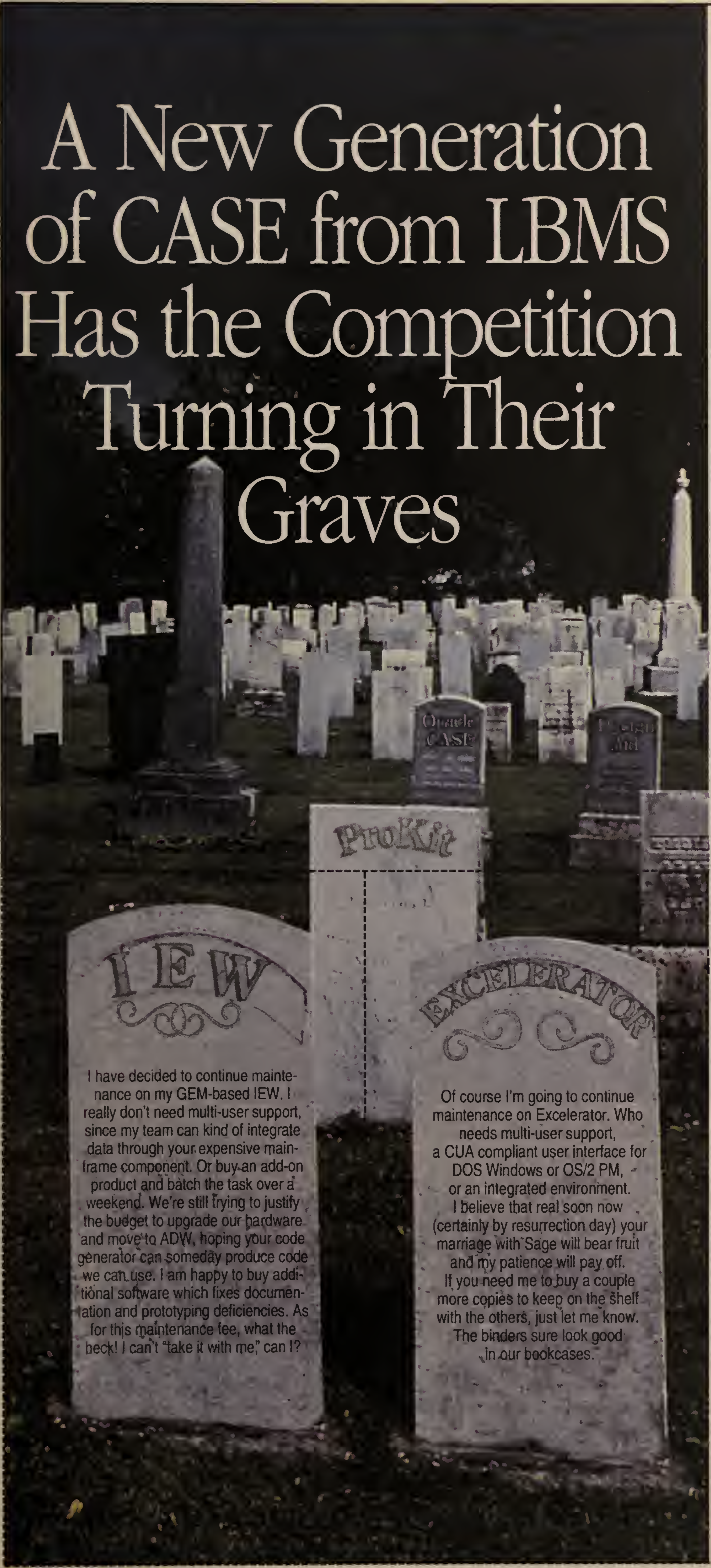

I have decided to continue maintenance on my GEM-based IEW. I really don't need multi-user support, since my team can kind of integrate data through your expensive mainframe component. Or buy an add-on product and batch the task over a weekend. We're still trying to justify the budget to upgrade our hardware and move to ADW, hoping your code generator can someday produce code we can use. I am happy to buy additional software which fixes documentation and prototyping deficiencies. As for this maintenance fee, what the heck! I can't "take it with me," can I?

Of course I'm going to continue maintenance on Excelerator. Who needs multi-user support, a CUA compliant user interface for DOS Windows or OS/2 PM, or an integrated environment. I believe that real soon now (certainly by resurrection day) your marriage with Sage will bear fruit and my patience will pay off. If you need me to buy a couple more copies to keep on the shelf with the others, just let me know. The binders sure look good in our bookcases.

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☐ Los Angeles September 19	☐ San Francisco October 3	☐ Philadelphia October 22

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Kodak's imaging plans shift to software

BY ELLIS BOOKER
CW STAFF

ROCHESTER, N.Y. — The reorganization that led to a $375 million restructuring charge for Eastman Kodak Co. last week refocused its electronic imaging strategy but by no means closed the shutter on this emerging marketplace.

Kodak officials, stung by press reports that said the firm was abandoning electronic imaging, declared that Kodak was continuing its movement away from enterprisewide imaging systems while moving toward being a premier supplier of imaging software and related peripherals.

"We still see enormous opportunities in imaging . . . but we recognize the need to improve the cost-effectiveness of both our commercial and consumer operations," said Frank P. Strong Jr., group vice president and general manager of the commercial imaging group.

Strong went on to say that Kodak's opportunities lie in color imaging. "We bring to the party a unique understanding of color image management," he said.

Still, Strong's 23,000-person group, which includes the Business Imaging Systems unit, will take the brunt of the 3,000-person staff reduction announced by Kodak last week.

The management shuffle included the appointment of Leo J. Thomas as president of Kodak's new image operating group.

In that role, Thomas will have worldwide oversight for photography and commercial imaging, which together account for $11.3 billion in sales.

Strong, who previously reported directly to Kodak Chairman Kay Whitmore, will now report to Thomas.

Wall Street woes

Meanwhile, Wall Street welcomed the restructuring news. Several analysts said Kodak simply had not realized enough profit from the hundreds of millions of dollars it has spent to date on imaging research and development.

Kodak's movement away from a systems strategy was capped in April, when it discontinued sales of its high-end imaging system, the KIMS 5000.

That system, based on the Digital Equipment Corp. VAX, has about 35 customers, who Kodak continues to support. The KIMS 4000, a four- to 12-station imaging system that uses personal computers on an Ethernet local-area network, is still being sold by Kodak, which claims to have deployed 300 systems since introducing the product in late 1987.

Kodak's image research and products efforts will now highlight electrophotographic (copier) technology, thermal printing and ink-jet printing.

Another key product area is likely to be high-speed scanners. Kodak's Imagelink 9000, with a starting price of $81,000, has been a good seller since its introduction two years ago, according to analysts. The scanner features optional bar code optical character recognition capabilities.

Regarding Kodak's existing joint development imaging projects, "none of our alliances are intended to be jeopardized or downplayed by this [restructuring]," Strong said.

The most recent of these was an April pact between Kodak and Lotus Development Corp., which said it used Kodak's base technology to "image-enable" Lotus' Notes. The image-enabled version of Notes is due in the first half of next year.

The restructuring will reduce Kodak's Rochester work force by 6%. Kodak said it will try to achieve the reductions through early retirement programs but will use layoffs if not enough employees take advantage of these programs.

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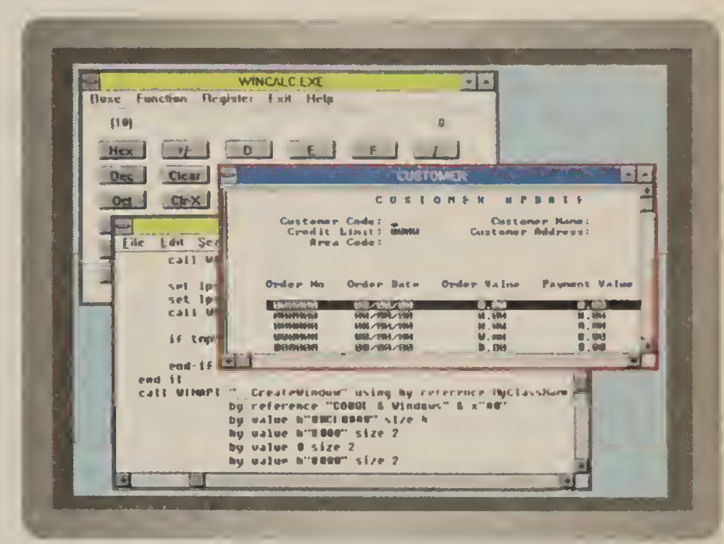
Why is Micro Focus Saving So Many People So Much Money?



CUSTOMER UPDATE

Customer Code:
Credit Limit:
Area Code:
Customer Name:
Customer Address:

Order No Order Date Order Value Payment Value

```
call W
set lp
set lp
call W
if tep
end-if
end if
call WINAPI "__CreateWindow" using by reference MyClassName
                 by reference "COBOL & Windows" & x"00"
                 by value h"00CF0000" size 4
                 by value h"8000" size 2
                 by value 0 size 2
                 by value h"8000" size 2
```

Graphical User Interfaces?

Graphical User Interfaces (GUIs) are becoming an important part of today's information processing environment and Micro Focus products give developers three user interface development options.

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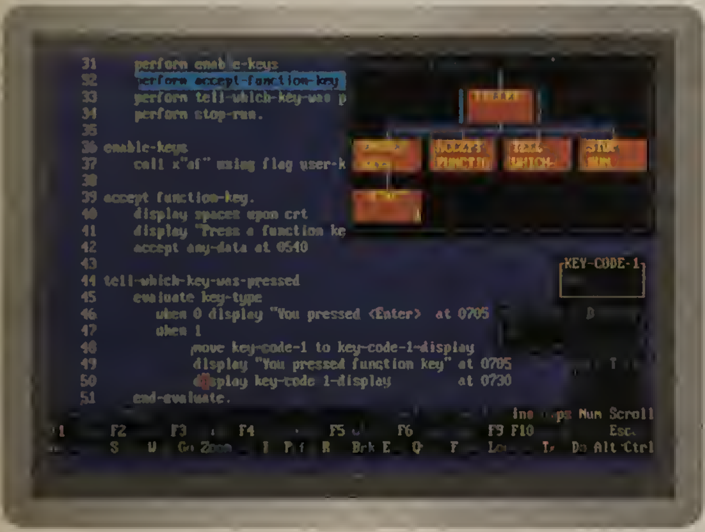
Besides the functionality offered within the compiler, Micro Focus also offers Dialog System,™ a high-level interface development package that offers the ability to quickly and easily develop both GUI and character-based user interfaces completely independent of the COBOL application. Applications developed with Micro Focus's GUI technology are faster to develop and make users more productive.


KEY-CODE-1
Ins Caps Num Scroll
F1 F2 F3 F4 F5 F6 F9 F10 Esc
S U Go Zoom I Pf R Brk E Q F Lo Tx Do Alt Ctrl

```
    perform enable-keys
    perform accept-function-key
    perform tell-which-key-was p
    perform stop-run.

enable-keys
    call x"af" using flag user-k

accept function-key.
    display spaces upon crt
    display "Press a function ke
    accept any-data at 0540

tell-which-key-was-pressed
    evaluate key-type
       when 0 display "You pressed <Enter>  at 0705
       when 1
            move key-code-1 to key-code-1-display
            display "You pressed function key" at 0705
            display key-code 1-display         at 0730
    end-evaluate.
```

Productivity Tools?

Micro Focus has been making COBOL programmers more productive since 1976 by supplying state-of-the-art tools and utilities that cut development time.

No other source code debugger in the industry provides better facilities for program testing and analysis than ADVANCED ANIMATOR.™ This unique debugger allows developers to step through program execution line-by-line, monitor data items in windows, even create a structure chart from an existing COBOL program.

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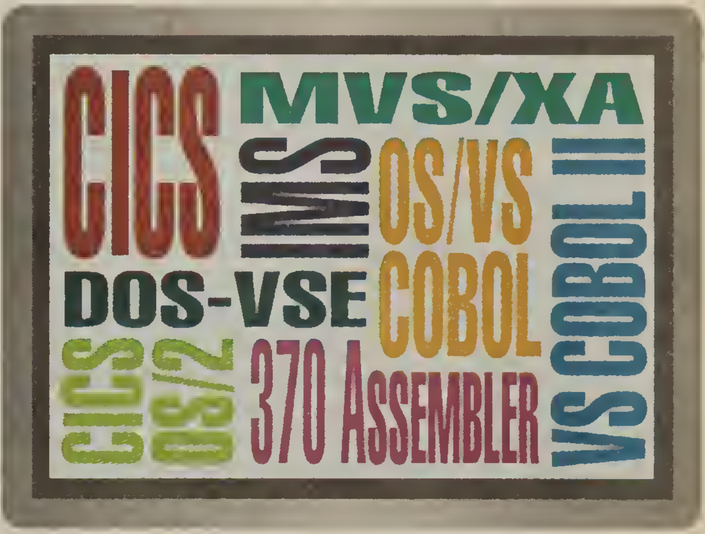

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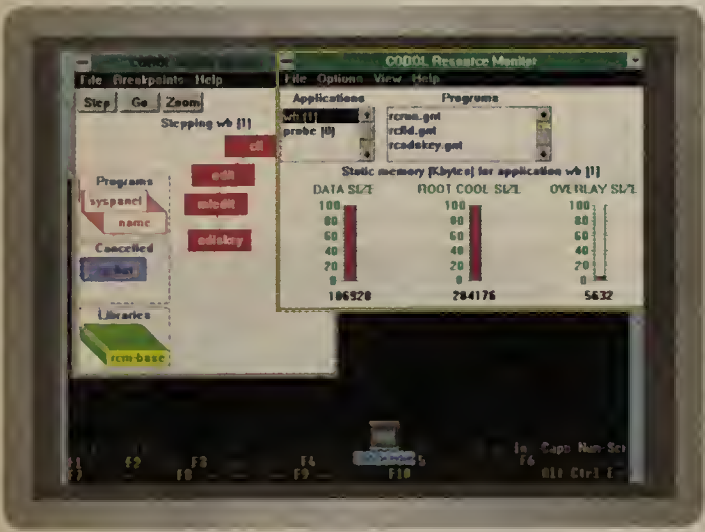

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ADVANCED TECHNOLOGY

Rebuilding the Sphinx in electronic form

Using PC and CAD, researchers attempt to solve the riddle of the Sphinx by viewing it in its initial form

BY ELLIS BOOKER
CW STAFF

Despite its weathered face and crumbling limestone exterior, the Great Sphinx continues to inspire awe and wonder in the visitors who stand before it on the Giza plateau in Egypt. How this 4,600-year-old monument, the last of the ancient world's Seven Wonders, has changed since it was built in about 2500 B.C. is one of history's great riddles.

Thanks to the combined talents of an Egyptologist and a computer engineer, who have created a painstakingly accurate three-dimensional model of the Sphinx, researchers are now able to peer into the past and catch a glimpse of what the Sphinx may have looked like in its early years.

Using sophisticated computer technology, the researchers have replicated the monument's features that time and modern environmental hazards have destroyed. They have restored the wonder's face, rebuilt a statue of a king that once graced its leonine chest and reapplied the red paint that once covered it from head to toe.

Computer simulation

The model's basic data comes from detailed maps that Mark Lehner, an Egyptologist at the Oriental Institute at the University of Chicago, prepared between 1987 and 1991, when he led a project to map the Sphinx for the first time. Lehner eventually made hundreds of drawings using a combination of photogrammetry and surveying techniques. He likened the task to "crawling over the colossus like a Lilliputian on Gulliver."

"The [drawings] document every single little rock and crevice," said Thomas Jaggers, computer-aided design (CAD) director at Jerde Partnership, Inc., an architectural design firm in Venice, Calif., that donated its services to the project.

The maps are contour drawings, showing the changing elevations of the Sphinx as viewed from above and on three sides, Jaggers explained. After digitizing the separate viewpoints, "we were able to lock each into place . . . giving us a complete 3-D wire-frame model." The work was done using Autodesk, Inc.'s Autocad CAD package running on an Intel Corp. 80386-class, 25-MHz personal computer with 4M bytes of random-access memory.

It was not until Jaggers and Lehner put a computerized "skin" on their wire-frame model that their creation began to take shape. They started with Autocad's computer modeling tools to create the model's surface but abandoned them for Quicksurf from Denver-based Schreiber Instruments, Inc.

"Autocad could do it but was too labor-intensive," Jaggers said. Quicksurf put the basic surface on each side — represented by 100,000 "control points" — in 20 minutes instead of the week that it would have taken using Autocad, Jaggers said.

Next, the team experimented with adding elements, such as the chapel of granite blocks situated between the two front paws, to the monument.

For the missing mortuary statue of Pharaoh Amenhotep II, which earlier records document and which Lehner said he believes was originally attached to the chest, topography data was scanned in from Abu Simbel, another famous Egyptian monument.

For the Sphinx's almost completely eroded face, Lehner chose to use that of Pharaoh Khafre, who built the monument as well as the second of the three pyramids at Giza. Khafre's likeness was digitized from a life-size statue and plugged into the Sphinx CAD model.

Mark Yankus

Finally, a 24-bit rendering package, Big D from Graphics Software, Inc. in Dallas, was used to apply a sandstone "texture map" and colors to the model.

The 24-bit color image can display 16.7 million colors simultaneously, enough to easily fool a viewer into thinking it is an actual photograph. The illusion is enhanced by the fact that the software can designate a light source to add a realistic play of shadows on the model.

The rendering process was handled on an Intel I486-class 33-MHz PC with a math coprocessor. That may seem like a lot of desktop power, but it took the computer four hours to produce these images from Jaggers' 9M-byte Autocad file.

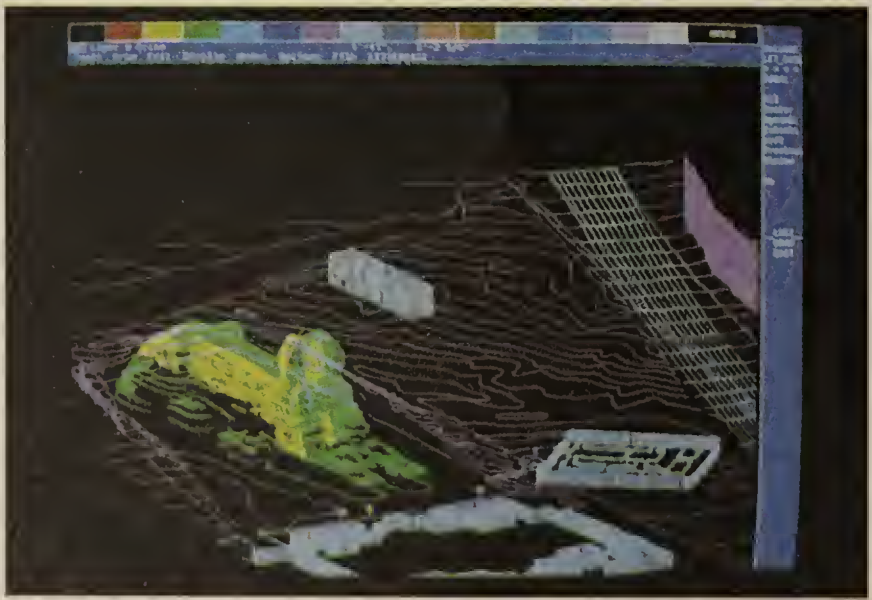
What now?

The computer model holds more than archaeological interest. Researchers hope to uncover ways to protect the ancient monument, which has emerged from the sands and the past only to face the destructive effects of air pollution and other environmental hazards.

Using data collected from measuring devices on the Sphinx's haunches that sample air pollution and other hazards, the researchers hope to advance their model to see what is likely to occur in 50 or 100 years, Jaggers said.

He added that program development needs to be done before such a dynamic model using this environmental data can be created.

Jaggers, who initially proposed the CAD project as "something to do on nights and weekends," said he has learned a "phenomenal amount" from the Sphinx project that has been applicable to his firm's 9-to-5 business. For example, the project has helped the firm learn how to work with enormous databases while being thrifty with data and has increased its own use of photorealistic CAD models.



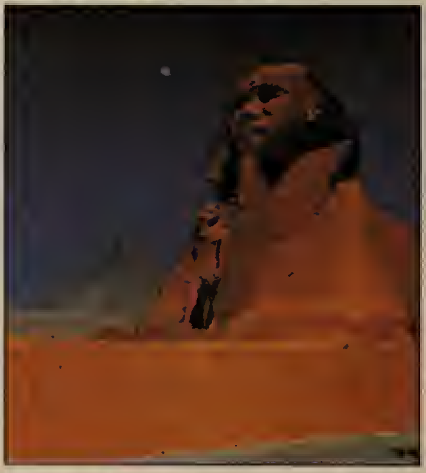
A three-dimensional viewing *of the Sphinx is possible with a CAD package from Autodesk, Inc., running on an Intel Corp. 80386-class, 25-MHz PC with 4M bytes of random-access memory*

Preventive medicine

The Great Sphinx at Giza was carved in 2500 B.C. from limestone and was later abandoned. Pharaoh Thutmose IV restored the monument in 1400 B.C.

French engineers cleared the Sphinx to its rock foundation in 1925 and 1926. Since then, it has been exposed to the ravages of erosion, air pollution and other environmental hazards.

Recent proposals for conserving the 66-ft.-high monument have included reburying it in the sand, enclosing it in a glass pyramid and constructing a retractable shelter over it.



Photorealistic computer image *of what the Sphinx may have looked like*

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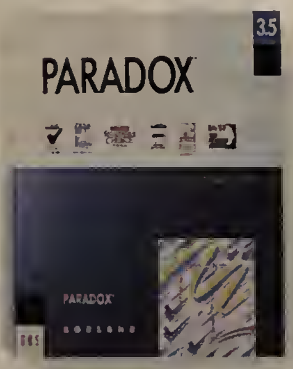

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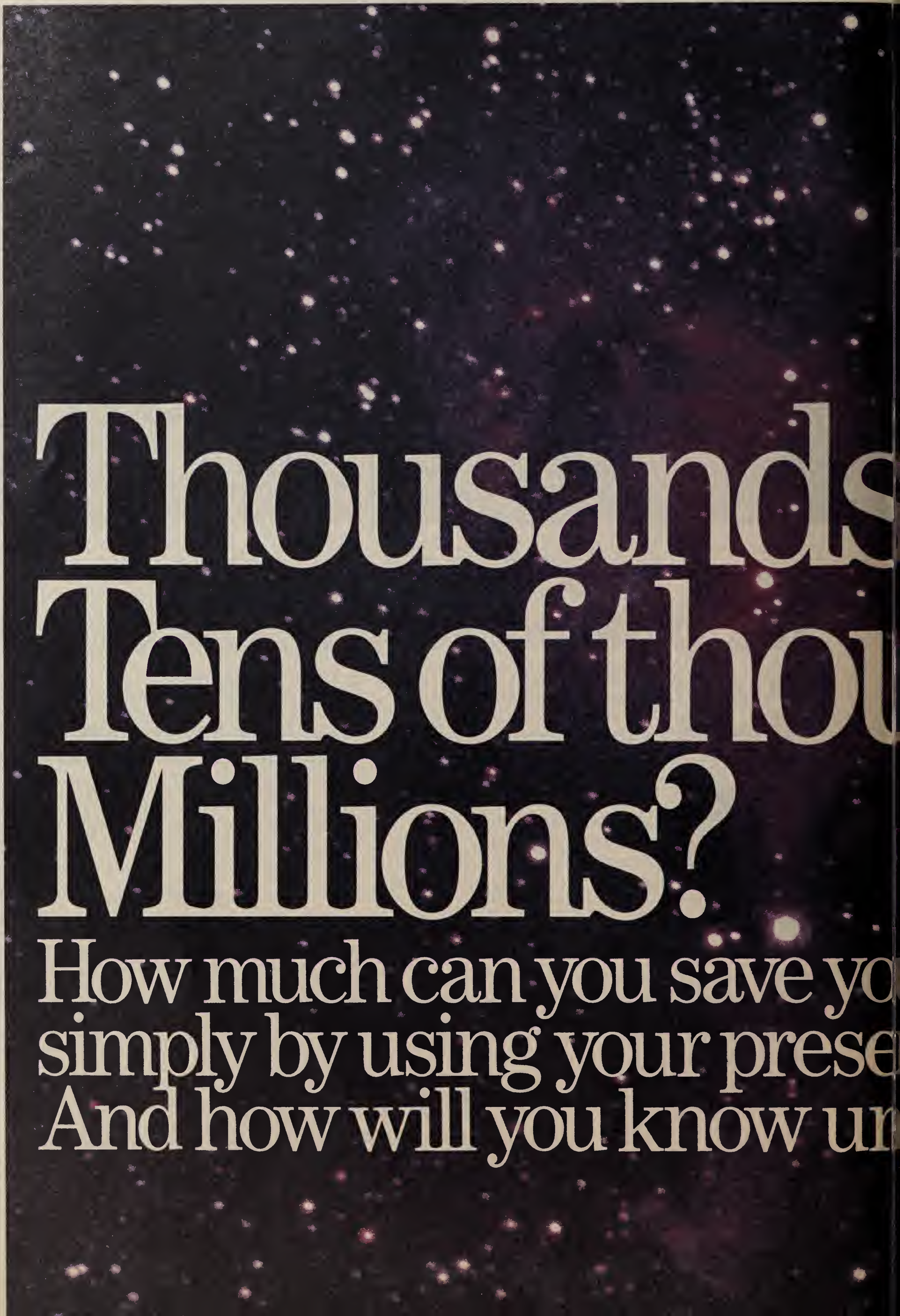
Thousands
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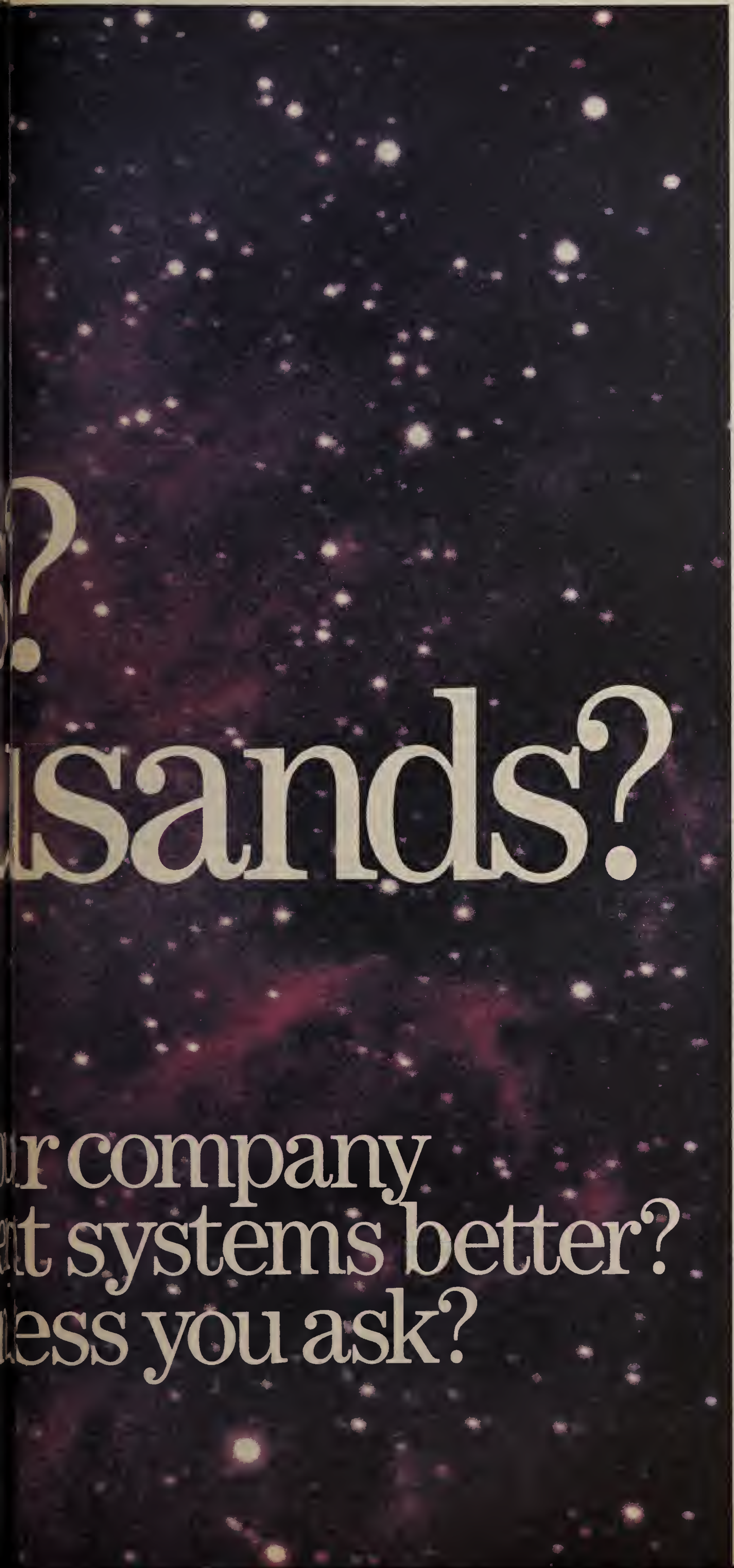

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EDITORIAL

Pound foolish

Last week's issue of *Computerworld* featured a story of great information systems resourcefulness in the financially strapped public sector. As we saw, persistent budget cuts are bringing out the best in state and municipal IS departments, which are offering some lessons that the private sector might well sit up and take notice.

In this week's issue, we write about a different kind of public sector resourcefulness. Staring down the maw of a $3 billion deficit, the state of Pennsylvania passed an omnibus tax bill that extends the tentacles of its sales tax to reach a very broad range of computer and programming services.

As of Oct. 1, the sales tax, which historically has applied only to tangible items in those states that have such a tax, will now envelop "computer programming services, software modification, custom software programming, involvement in all phases of systems development from design through installation" and several other items. It will also apply to lawn care service — they're cutting it that short in Pennsylvania.

No doubt, there are lots of good reasons why the state needs more money, not the least of which are recession-induced revenue shortfalls. And then there are lots of bad reasons, such as the inability of most big government institutions to bring expenditures more in line with income.

The shortsightedness of this form of taxation is appalling, and we have to wonder if some contaminants from the Three Mile Island debacle are still wafting in the direction of the capitol building in Harrisburg.

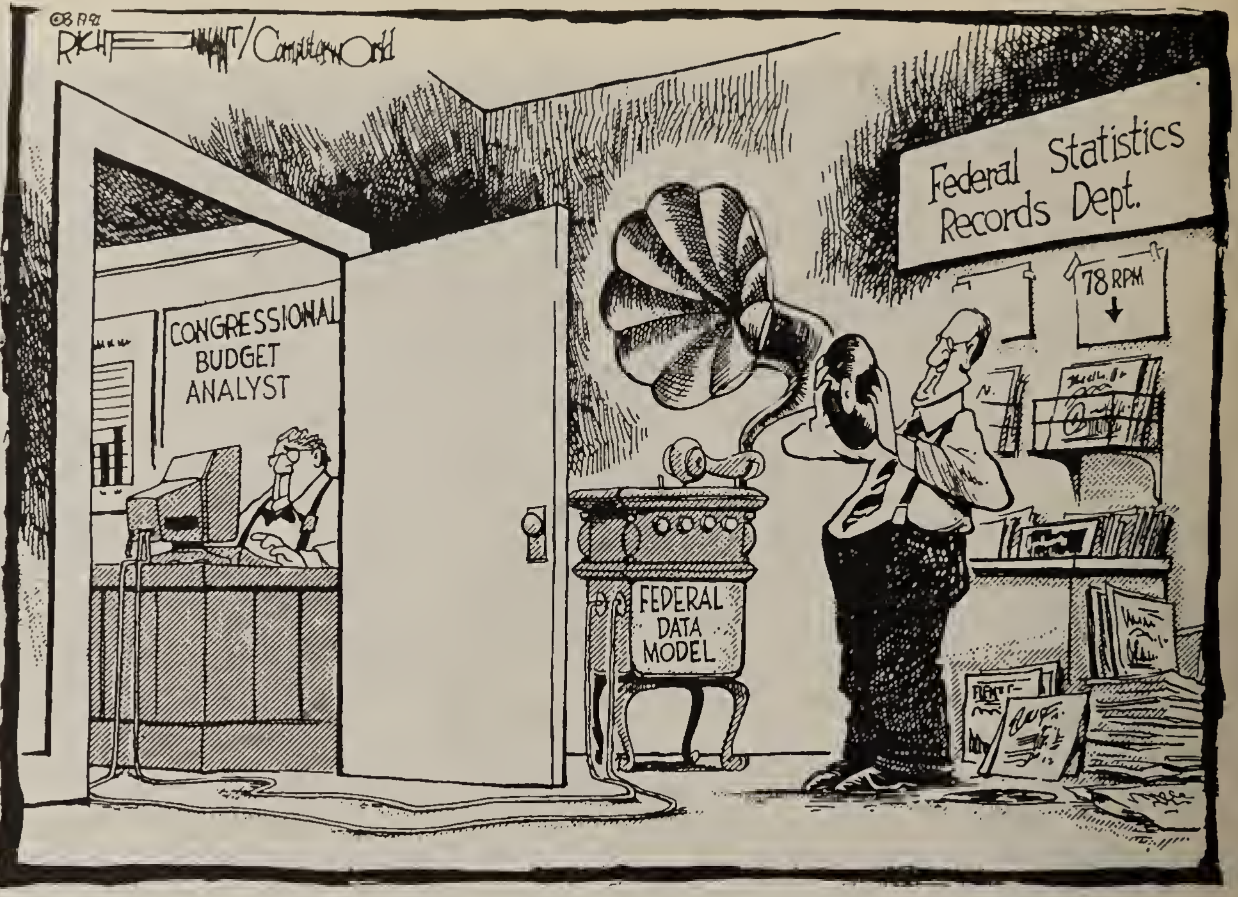
Provided that neighboring states such as Delaware and New Jersey don't follow this service tax lead, what's to stop scores of revenue- and job-producing computer service companies from setting up shop outside Pennsylvania and producing and booking sales of their services in other states? Nothing, that's what.

What stopped scores of data centers and literally thousands of IS jobs from fleeing New York City's ludicrous tax umbrella for more user-friendly environments? Nothing. Is New York better off today for the high-paying professional jobs it scared off?

Deciding where the tax burden will fall is like trying to pick a site for a new prison or hazardous-waste dump. Many, if not most, people agree it is necessary, but no one wants it in his backyard.

With computer hardware production in decline or at least moving offshore, the software and services sector remains one of very high growth potential. Advances in low-cost digital communications make it increasingly possible to locate computer service companies some distance away from the metropolitan areas where the client base lives.

Recognizing this reality, many nonindustrial states such as Kentucky are positioning themselves to attract service computer companies. Someone there ought to write the Pennsylvania legislature a nice thank-you letter.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LETTERS TO THE EDITOR

AI clarifications

On your recent coverage of artificial intelligence in the July 22 and 29 issues, the articles nicely surveyed the positive progress of AI these days.

One matter about my column, "Why IS needs to watch AI" [CW, July 29]. You changed my wording in a small but very important way, and I don't want your readers to misunderstand me. The areas I listed briefly — expert systems, neural networks and so on down to vision and robotics — are not "other similar" technologies to AI, but rather they make up AI.

AI consists of all this stuff forming one coherent area: It isn't something else as well.

This is important because understanding this coherency is helping us move from narrow laboratory prototypes into the real world of increasingly complex systems, where AI begins to merge with more traditional computing, as several of your articles correctly emphasized.

One last issue. You note that some would "never say AI." Yes, we know this name is a slight embarrassment but have been stuck with it now for 25 years and have come to accept it. The fact is that it is now in common usage. The solution is to say "ay-eye" and try to forget what it stands for.

Pat Hayes
President
American Association for
Artificial Intelligence
Menlo Park, Calif.

Fuzzy analysis

Regarding your Aug. 5 analysis of the IBM PS/2 L40SX and the Toshiba T2000SX, trying to compare the two is virtually impossible.

The overall rating from *PC Magazine* for IBM is "fares poorly overall," while the *Infoworld* rating for Toshiba is "7.4." How does one compare the two?

James Metzler rates the IBM power supply as fair and the Toshiba poor while the text pans the IBM power supply, giving it a two-hour life vs. the potential of four hours for the Toshiba. Metzler's overall rating is that the Toshiba has an "inadequate power supply" while IBM's rating is "great."

I've been in the business 26 years, and I've seen IBM machines that have ranged from winners to total losers. Which is this? Where does it fit in the continuum?

If any one of these analyses is taken in isolation, the reader might be able to draw some kind of picture about the ratings. Although, when two people rate the Toshiba power supply, and one rates it as poor and one very good, what is the reader to think?

Sy Fischthal
Director
Administrative Systems
Queens College
Flushing, N.Y.

Unix user speaks

I read with interest the article "OK crowing over 4GL benefits" [CW, Aug. 5] concerning OK Industries, Inc., the poultry company located in Fort Smith, Ark.

Its story is similar to another Arkansas poultry company, headquartered in Siloam Springs, by the name of Simmons Industries.

Simmons, which might best be noted for its appearance on *60 Minutes*, was moving to Unix and a fourth-generation language (4GL) about the same time OK was moving to a 4GL and Microvax. Both companies previously had IBM System/34s.

While OK has reaped benefits from its new hardware and software platforms, Simmons has also had substantial growth through product diversification and acquisitions.

Unix has assisted Simmons with its decentralized operations and acquisitions in utilizing a combination of reliable and cost-effective forms of distributed processing.

Unix boxes are placed in selected remote locations, while all software maintenance, support and systems administration is done from corporate offices. A corporate office local-area network is linked via Transmission Control Protocol/Internet Protocol to Unix and provides centralized executive management with up-to-date information.

Simmons Industries was the first U.S. poultry company to put Unix in its corporate offices. While their overall systems design and methodology may not be that unique, the vision to utilize Unix has kept their options "open."

Gary L. Wilf
Springdale, Ark.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

Threat of freed BOCs is overrated

PETER MARX

One of the hardest fought battles in political history may be drawing to a close. On July 25, U.S. District Judge Harold H. Greene surrendered his role as gatekeeper for the information services industry by reluctantly ruling that he could not keep out the Bell operating companies (BOC).

Although some opportunities for appeal remain and an extensive congressional lobbying battle will continue, the BOCs appear to have swung the momentum in their direction: By the end of 1992, they will probably have the opportunity to provide information services.

Opponents of the BOCs, such as newspaper publishers, have ably argued that the BOCs will abuse their monopoly connection to every home and business. Time will tell whether such fears are well-founded. In the meantime, opportunities will explode for information services.

Aside from investment capital. the BOCs will bring knowledge to the information services industry of information delivery technology that can only help existing vendors and users. Ironically, the most likely dynamic for the industry is not that existing vendors will be put out of business but rather that alliances will flourish and the current players who partner wisely with the BOCs will prosper.

The information services industry has always been one in which no one player could do it all with regard to controlling information content, technology or distribution channels. Instead, customers, suppliers and competitors have teamed with one another for mutual advantage. This will be even more true as the BOCs join the industry. Success will follow more from choosing the best partners and structuring the right deals than from having the best technology or marketing capability.

All firms, not just BOCs and information services vendors, have much to gain from the new landscape in this fast moving industry. Through strategic alliances, many players who are not currently in the industry may be able to leverage their business strengths to reach new markets or create new profit centers.

SUCCESS WILL FOLLOW more from choosing the best partners and structuring the right deals than from having the best technology or marketing capability.

For example, through the exploitation of information technology, Mead Corp., an old-line paper producer, has become one of the leading providers of on-line information to the legal and business communities.

Similarly, Sears has combined its marketing capability with IBM's knowledge of information technology to provide Prodigy to almost 1 million users. But in the view of industry observers, the joint venture has not been a success. Could adding a BOC as a third partner make the difference between success and failure? Because achieving a maximum number of users is critical, the BOCs' connection to every home and business might help. Also, the BOCs' delivery technology abilities would be relevant to improving aspects of the system such as response time.

As for the BOCs, there is nothing to say that they could succeed in going it alone where others have not. There are services that the BOCs are well-positioned to provide. They may also be more successful if they proceed through joint ventures.

Even as the final battles are being fought, it is time for the BOCs, the information services companies and other companies interested in becoming participants in the industry to position themselves, map their strategies and begin to establish relationships. The relationships that are formed now, whether through alliances or through joint ventures, will be critical for success in the next several years.

Marx, chairman of the Marx Group law firm in Wellesley, Mass., advises companies on strategic alliances and business deals involving information services.

Everyone copies software

Laws to protect invention are now stifling it

CURTIS E. A. KARNOW

Copyright protection was written into the U.S. Constitution to protect and reward innovation and to benefit the consumer with better products. But now that computer programs are covered by copyright, the opposite often occurs.

What, after all, is a program? Lotus 1-2-3 and Wordperfect 5.1 are programs; so are operating systems such as Windows, PC-DOS, varieties of Unix and games written in Basic, C++ or any other language. Why? Because a program is a set of instructions to the hardware. Under that innocuous definition, a macro written in Wordperfect's macro editor is a program.

And what is copying?

Everything is copying. Any use of a program requires that it be copied, even if copied into RAM off a hard disk or off of a server.

Even broader, any modification of a program can be copying. Nintendo Co. recently argued in San Francisco Federal Court that a handheld machine designed to change the powers and attributes of video game characters in effect created a new, slightly different program — and was copyright infringement.

There's more. Some cases hold that the "structure, sequence and organization" of a program can be protected, even where the code is never copied; and most of you have heard of the "look and feel" cases in which duplicating the appearance of a program is copying.

But in the mirror world of the computer, copying is required. Users copy all the time, but so must programmers. They copy because standards require it (formal or informal); because they are writing an add-on product; because any other method would be highly inefficient.

Under the "fair use" doctrine, some copying may be perfectly legal. The difficulty is predicting when. Making a copy of a television show on a videocassette is usually fair use, although millions were spent in court arguing otherwise. Long ago, copying into RAM was ruled to be fair. Recently, Nintendo's suit described above was thrown out by the judge, who cited the fair use doctrine.

What is fair use? No one knows. But without an expansive and predictable fair use doctrine, the threat of litigation over copyright remains an impediment to innovation, ease of use and wide distribution of computing power. Copyright was meant to protect those interests. It is up to those in the business to know the legal issues and to bring the law back to reality.

Karnow is a partner with the law firm Landels, Ripley & Diamond in San Francisco, where he chairs the Competitive Practices Group and the Automation Committee.

Intelligent robots may conclude: Why work at all?

JOE PANEPINTO

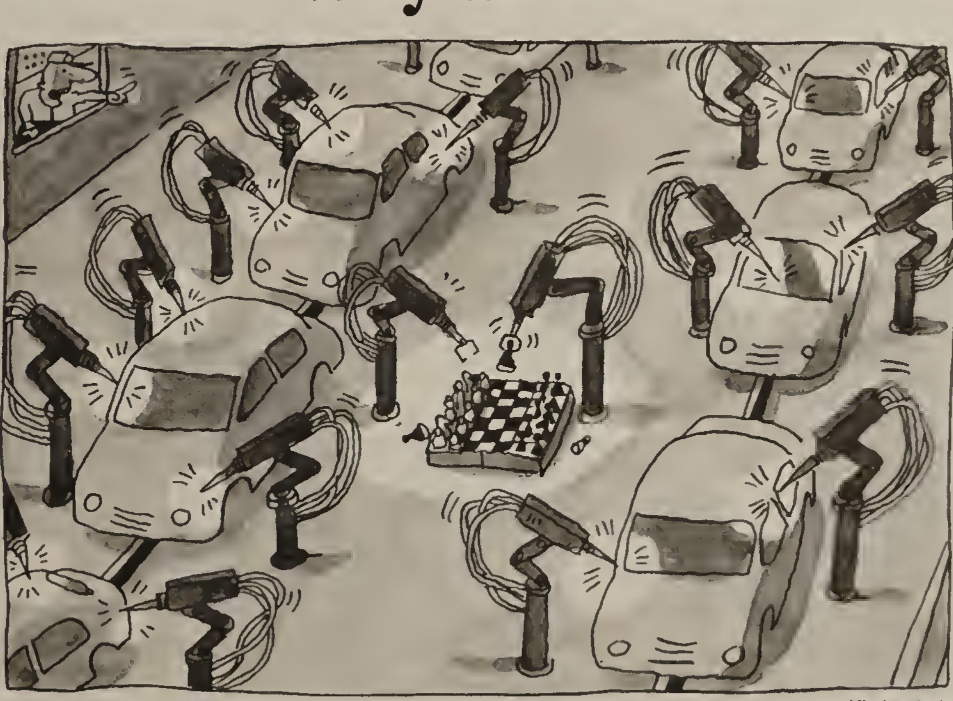
Enthusiasts of expert systems and robots who envision a future workplace bristling with productivity and uninterrupted by the vagaries of employee-management conflict, please take note: The truly intelligent computer-controlled robot of the future may not want to work for you.

But don't take it personally. Such a system may not want to work for anyone. After all, if researchers in robotics and artificial intelligence build a robot with common sense, it may come to the same conclusion human workers so lovingly embrace — why work at all?

Rather than a world of shiny chrome-and-wire efficiency, the future electronic workplace may be a shabby amalgam of work-avoiding robots of all strains — what science fiction writer Stanislaw Lem calls malingerants and drudge-dodgers, loiterants and fudgerators.

But it is to be expected. For a machine that can produce millions of instructions per second, coming up with an excuse not to finish work may be a much less daunting proposition than doing the work itself. It's easy.

Depending on your point of view, common sense may say, "Do the job." But, if the work load is especially boring, as is most assembly line work that has been turned over to computer-controlled robots, common sense may just as easily say, "Feign a fever," or "Blow a bolt."



Niculae Asciu

As in many a science fiction tome, expert systems and AI-controlled robots apply Chapulier's Rule of Least Resistance to every instruction, invariably coming up with the algorithm: A + B = "take a nap."

The work history of robots in cinema is equally abysmal. Celluloid robots — those constructed of metal and wire but powered by fame on the big screen — don't have a particularly good track record of doing their jobs efficiently and obediently.

AI researcher Doug Lenat at Microelectronics and Computer Technology Corp. in Austin, Texas, is hard at work building a knowledge base for expert systems software that incorporates common sense statements such as, "Nothing can be in two places at one time," or "If it is raining, take an umbrella." Lenat estimates that there are more than 10 million such statements. I say there are more, many of which relate directly to work. How about, "If your boss is watching, look busy" or "If you can't get out of doing something, screw it up so you won't have to do it again."

Lem has a term for computers that do the latter: mimicretins — machines that play stupid in order to be left in peace.

There's more. If workplace laziness is no longer the sole domain of humans, can robot lechery and lawlessness be far behind? The future may be filled with computer-controlled delinquents of all kinds — dejects, dynamoks and cyberserkers.

Whatever the structure of that future world, one thing will be certain. If robotics and AI continue to evolve, the resulting robots are sure to come to the commonsense conclusion that all work and no play make robots dull toys.

Panepinto is a senior writer at *Digital News*, an IDG publication in Boston.

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SYSTEMS & SOFTWARE

NEW DEALS

Unisys hits 1,000

Unisys Corp. recently passed the 1,000 mark in shipments of its 2200/400 midrange mainframe family. The company sold the 1,000th system, a four-processor 2200/448, to the German Patent Office in Munich, Germany. The patent office will use the computer to support its technical library.

Doosan Glass Co., the largest glass manufacturer in South Korea, recently installed a computer-integrated manufacturing system from Digital Equipment Corp. DEC was the prime contractor for the $375,000 project, which integrates the operations of a new furnace at the glass company's plant in Kunsan, South Korea, with field data.

R&I Bank of Western Australia Ltd. in Perth, Australia, is installing an integrated financial system from Dallas-based Hogan Systems, Inc. for profitability measurement and reporting by large commercial banks and thrifts. The Earnings Analysis System from Hogan will be used as a decision support tool by R&I.

CA fills in HR software plans

Fleshes out details to bring together three product families of Insci

BY JOHANNA AMBROSIO
CW STAFF

Computer Associates International, Inc. announced new financial applications and provided more details about human resources software it has recently acquired.

At a recent conference of CA applications users, company executives expanded on their previously announced plans for the acquisition of Information Science, Inc. (Insci), a human resources firm in Montvale, N.J.

Plans call for the three Insci product families and CA's existing human resources software to be brought closer together over time, with similar base technologies including user interfaces, reporting capabilities and other features. However, CA executives stressed that all four product lines will be enhanced and maintained separately but simultaneously.

"It certainly does include an ongoing enhancement of the existing solutions as we evolve to the common facility across all the platforms," said Ron Nunn, senior vice president of research and development. "To some degree, this is a continuation of where Insci had been going with the products. We're evolving those further to include multiple platforms as well."

Still more from CA

Other announcements from CA included the following:

- Mastervision 1.0, a workstation-based executive information system that accesses financial data from mainframes and minicomputers and converts it into graphs.
- Version 3.0 of Masterstation, a desktop version of CA's Masterpiece financial software that now runs under Microsoft Corp.'s Windows and Novell, Inc.'s local-area networks.
- A cooperative processing implementation for Masterpiece applications running electronic data interchange (EDI).

Mastervision 1.0 combines four existing CA products into one product that can access data in Masterpiece applications on IBM and Digital Equipment Corp. computers and convert the data into graphs. The software works with Windows under DOS 3.1.

Other Masterstation enhancements include supporting different national languages. Menus, screens and reports can be customized for specific languages.

Both Masterstation 3.0 and Mastervision 1.0 will be available for beta testing in the third

Continued on page 26

Traders build systems from clean slate

ON SITE

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — When JoBette McCann joined a start-up trading firm two years ago as vice president of systems, there were few systems to actually manage. Now the company owns a full complement of hardware and software, including a minicomputer and workstations that will soon be linked together.

London & Bishopsgate International, Inc. (LBI) in New York, is a trading concern that specializes in international markets. With more than a half-billion dollars under management and some 50 employees, LBI trades various instruments, including currencies, equities and futures, and also provides money-management services for clients.

Trade talk

Key aspects of London & Bishopsgate International, Inc.'s environment include the following:

- A Digital Equipment Corp. VAX 4000-300 that supports the trading floor, operations and business applications including general ledger. Users are linked through Decnet.
- A separate TCP/IP network for quantitative research done mostly on Sun Microsystems, Inc. workstations and Compaq Computer Corp. PCs. Plans include linking this network to Decnet later this year.
- Another stand-alone network of Apple Computer, Inc. Macintoshes for client reports and presentations.

CW Chart: Janell Genovese

Back in 1989, when McCann signed on as LBI's fifth employee, the company possessed a used personal computer and a used laser printer. Her challenge, she said, was to "do what I could to get us into business by providing basic computing facilities but also to make sure that I put in an architecture that would serve our future business needs."

She said that flexibility and the ability to connect different environments were key factors. "One of our philosophies is that we want to be able to trade whatever instrument we want to in whatever market we want to." Especially given the dynamic nature of the global marketplace, she said, "you'd better have the technology there to support the business."

Originally, LBI relied on individual PCs and workstations — Apple Computer, Inc. Macintoshes for the marketing department, Compaq Computer Corp. boxes for the administrative staff and Sun Microsystems, Inc. workstations for the quantitative research staff. All these areas were tied together with their own networks.

"If you're only five or 10 people, you want to see how things develop, how people are brought on board. I wasn't going to walk in and say, 'We're going to have a Novell network, this many PCs,

Continued on page 28

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PHOTO BY KEN TOUCHTON

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NCR refocuses on System 3000 goals

BY ELLIS BOOKER
CW STAFF

SAN DIEGO — Temporarily distracted by its acquisition by AT&T, NCR Corp. is again getting down to the business of bringing out its System 3000 Unix computers.

The job of building the two top machines in that line — the System 3600 and System 3700 — falls to Michael Lambert, general manager at NCR Engineering and Manufacturing here.

Lambert's organization is also developing software to take advantage of the massively parallel Intel Corp. I486 architecture of the two models.

NCR's Lambert: *Nursing 3000 line*

However, a group of NCR users is also watching Lambert's efforts to build a migration path leading them from their two proprietary mainframe lines to the System 3000.

"On the I series side, we believe in the next three years it's conceivable 50% to 65% of these applications will have moved over [to the System 3000]," Lambert said. He added that migrating the older V line (the 9800 series) will likely take longer.

According to NCR, there are some 20,000 I series and another 3,000 9800 systems deployed.

One of NCR's large proprietary mainframe customers, California Insurance Group, has been awaiting NCR's move to open systems for some time and has planned accordingly.

"We've been aware of where they've been headed for the past three years," said Sherman Jones, manager of technical services and operations at the Monterey, Calif.-based insurer.

Jones' information systems department has invested more than $6 million in NCR gear: The company's data center sports four linked NCR 9800-class mainframes running under NCR's proprietary VRX/E operating system.

Devoted to NCR

"Quite frankly, we toyed with the idea of changing vendors . . . but we feel most everything we need is with NCR," Jones said, adding that he will be off the V series by 1999. One dilemma, Jones said, is how to migrate the third-party transaction processing monitor he now uses to NCR's Top End product.

NCR has already announced a variety of migration tools for both populations.

Lambert said NCR is finishing development of a system, known internally at NCR as Galaxy, that allows I series customers to move applications to the System 3400 or 3500.

Alternatively, customers can take advantage of a recompiler facility to convert I series as System 3000 code.

Galaxy was shown at the NCR Nucon user meeting in San Antonio in April. According to Lambert, it will be ready for early customer release in the U.S. early next month.

In an interim move, 9800 customers will be able to physically attach a System 3000 to one of the 16 mainframe bus slots.

While the 9800 is a proprietary architecture, its use of loosely coupled shared modules is a predecessor of the System 3000 design.

Once attached, modified versions of NCR's transaction monitors for each platform will enable applications to interoperate between the proprietary processors of the 9800 and the I486 processor of the System 3000.

For an easy move

Finally, to ease migration of applications from the proprietary host, NCR will offer a software gateway between DBSR (the proprietary database on the 9800) and Unix relational databases from Sybase, Inc. and Teradata Corp. on the System 3000.

"In the next 18 months, we'll probably go with System 3000," said Randy Hitchcock, assistant vice president of operations at Abbott Bank in Alliance, Neb.

The bank uses an NCR ITX 9500 mainframe with 3G bytes of disk storage as a central processor for its 11 branches.

Boole revises performance monitors

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Boole & Babbage, Inc. has enhanced its Mainview line of integrated performance monitors, along with Mainview's automated operations software package, in a series of moves designed to simplify installation and use of the $93 million firm's flagship product.

The revised software, currently in beta testing, provides a single set of user commands for the Mainview console system. A series of enhancements will be provided at no cost to current Boole users, the firm said.

The new release provides a common series of user interfaces, operator commands and automated log-on features supported by Boole's "base technology" communications utilities. The enhanced software will be generally available Sept. 1.

For example, users of IBM's IMS and DB2 database systems, the CICS teleprocessing monitor and the MVS operating system will be able to use the same commands to review performance statistics for all their subsystems, said Olivier Thierry, director of marketing at Boole.

Further enhancement

At the same time, Boole enhanced its Auto Operator software, reducing the number of keystrokes needed to reconfigure a subsystem. The new version, Auto Operator 2.1.1, has a new "scripting" feature that retains the keystrokes used to repair system problems.

Longtime users welcomed the changes, which are part of a gradual evolution toward greater integration of console packages and greater ease of use.

"All the packages work the same way," said Craig Waddell, manager of technical support and operations at Central Hardware Co. in Bridgeton, Mo. "I think they're advanced when it comes to end-user features." Central Hardware converted from competing performance monitors nearly two years ago, he said.

Some users said the automated operations features would boost productivity at data center sites with small operations staffs. "We've had a part-time person working on all these products for the last four years," said James Ullery, manager of technical services at Stone Container Corp. in Chicago. "It would have been difficult, if not impossible, for that person to get all the products talking to each other if we had bought tools from different vendors."

Softwarexcel signals service push by IBM

BY ROSEMARY HAMILTON
CW STAFF

IBM is making another push on the software services front with the recent introduction of an operating system installation program.

Softwarexcel Installation Express is an extension of the Softwarexcel program that the company introduced nearly two years ago. The current plan calls for IBM to install and test mainframe operating systems for a fee that will range between $16,000 and $25,000.

Small targets

The company is not targeting the largest IBM shops, which typically have this kind of expertise in-house. Instead, it is aiming at shops that are "one tier down, those who change their operating system, say, every three or four years," explained David Brandt, IBM's director of enterprise systems software service and support.

"We don't expect to sell the McDonnell Douglases of the world," Brandt said.

Brandt said a smaller shop is more likely to determine that it is more cost-effective to pay IBM a fee to handle such routine operations as installing a new release of an operating system rather than to maintain the necessary expertise internally.

Brandt added that IBM is currently evaluating other information systems activities that would fall under the same category. Softwarexcel Installation Express, he said, is "one more in a series of offerings, and you can expect more."

Softwarexcel was introduced in December 1989 as a program to provide a range of software-related services to high-end customers.

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Ally expands Unix OLTP scope

BY KIM S. NASH
CW STAFF

BLUE BELL, Pa. — Ally Software, Inc., a subsidiary of Unisys Corp., said recently it will integrate Ally, its fourth-generation language (4GL), with both Tuxedo, the on-line transaction processing (OLTP) monitor from Unix System Laboratories, Inc., and Sybase SQL Server, a relational database management system from Sybase, Inc.

Tuxedo is currently the only transaction monitor available to users who want to do OLTP in a Unix environment, noted Dave Mucka, president of Applied Information Sciences, Inc., a Landover, Md., consulting firm.

Ally's 4GL is also the only front-end application development tool that can talk to Tuxedo, which has been adopted by X/Open Consortium Ltd., the committee that sets international Unix standards, Mucka said.

Ally's integration of its development language and Sybase's RDBMS with Tuxedo means users can build Unix-based OLTP applications in compliance with X/Open rules — an important business advantage for companies with facilities in foreign countries.

Companies that run Sybase SQL Server on Sun Microsystems, Inc. Sparcstations and IBM RISC System/6000 workstations will be the first to see results of the software integration in the form of products scheduled for delivery late this year and early next year, Ally said.

In other company news, Unisys announced last month a new cartridge tape library, beefed up versions of its M9710 and M9720 disk systems and the next product in the M9700 disk subsystem line, all for large systems from Unisys and IBM.

The new M9730 disk system, with storage capacities ranging from 5.7G bytes to 22.7G bytes, supports Unisys A16, A17 and A19 mainframes. It is slated to ship in October at prices starting at $228,000.

The new models of the M9710 and M9720 disk subsystems have double the data capacity of previous versions. Prices range from $321,000 to $772,000 for the M9710 and from $218,000 to $540,000 for the M9720.

The Unisys Cartridge Library System is available now for Unisys 2200 machines, with Unisys A series and IBM mainframe versions slated for late this year. Prices range from $561,000 to $1.064 million.

CA fills

FROM PAGE 23

quarter, CA said. The packages should be generally available around six months later.

The EDI implementation lets users transmit and receive electronic versions of purchase orders and other documents that use Masterpiece data.

James D. Bumgardner, director of data processing for the city of Huntington, W. Va., said he has no current need for the EDI product. But, he said, he was "really impressed" with Mastervision during a demonstration. "I can see where that could really help to enhance management information processing."

He said his employer has no immediate plans to purchase Mastervision, especially given what he was told would be the price range — between $10,000 and $20,000 per copy. CA has not officially released any price range for the product. Instead, Bumgardner said, he may buy some of the Mastervision components individually from CA "and do it myself."

Another user said she cannot use either workstation product. "We have OS/2 local-area networks, and so we wouldn't opt for something that runs only under DOS," said Cynthia Long, manager of information systems for the Liquidation Division of the State Board of Insurance in Austin, Texas.

If You Really
Want To Change
The World,
You Have To
Work From The
Inside.

S/Cubed jumps on the client/server bandwagon

Firm claims automation, task division for its application builder, but analysts stress caution

BY KIM S. NASH
CW STAFF

STAMFORD, Conn. — Add S/Cubed, Inc. to the list of CASE vendors that have sprouted client/server wings — or at least have said they want to fly in client/server skies. The 18-month-old maker of computer-aided software engineering (CASE) tools unveiled Supre/Daisys, a set of tools that S/Cubed President John Rade said can help developers build applications for client/server computing.

This announcement comes on the heels of CGI Systems, Inc.'s recent declaration that it had taken the first step in its client/server application development strategy [CW, Aug. 12].

As with other vendors touting client/server CASE capabilities, analysts said they were skeptical of S/Cubed's claims of automatically and appropriately dividing tasks between personal computer or workstation and host machine.

According to Vaughan Merlyn, partner at Ernst & Young's Center for Information Technology and Strategy, vendors perceive client/server as important to their market positioning, so claiming client/server functionality "is a sales advantage."

Supre/Daisys reportedly splits an application between client workstation or personal computer and server by deciding which tasks of a program are better performed on which platform, based on business process and technical information provided by a company's software developer, Rade said.

The product, available now for $18,000 and up, differentiates between the technical requirements of information systems and the needs of the end user, according to Rade.

One noteworthy feature of Supre/Daisys, according to John Palmer, an analyst at consulting firm Atlantic Sytems Guild, Inc. in New York, is that the program allows an end user to redesign an application interface without exiting the CASE tool. For example, if a user dislikes the look of an application, he can reportedly redesign the interface without corrupting data that icons or menus are tied to. The product can build interfaces compliant with Microsoft Corp.'s Windows 3.0, IBM's Presentation Manager and the Open Software Foundation's Motif/Open Look. "With most tools, you have to break out of the application to create a new [graphical user interface]," Palmer said.

ANALYSTS SAID THEY were skeptical of S/Cubed's claims of automatic functionality.

However, he cautioned would-be buyers to look hard at CASE products claiming client/server functionality. Client/server development cannot be completely automated because "there's so little real knowledge about how to divide functionality between client and server."

Palmer said building applications to run in a distributed environment requires a team approach, with input from a firm's end users and software developer and either an in-house or outside consultant who has experience in distributed computing.

Supre/Daisys works with S/Cubed's Daisys, a three-module set of CASE tools for building mainframe applications in C or Cobol. According to the company, Supre/Daisys supports DOS, IBM's OS/2, Unix System V and MVS, among others.

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GOAL

Energy work spawns server

Automated storage management software targeted at the Unix market

BY JEAN S. BOZMAN
CW STAFF

SAN DIEGO — A nuclear energy engineering firm is selling the rights to an enterprisewide Unix file server that automatically "migrates" data files from expensive disk drive storage to less costly tape cartridges and archiving optical discs, depending on the frequency of use.

This automated management of data files is similar in concept to that employed by IBM's Systems Managed Storage, industry analysts said.

The automated file server, called Unitree, was developed by Lawrence Livermore National Laboratory. It grew out of the laboratory's efforts to manage the vast amounts of data churned out by supercomputers and mainframes.

Marketed by Discos

The rights to license Unitree were obtained last year by General Atomics, based here, and are being marketed by its Discos division.

Unitree provides hierarchical storage management and moves files without user involvement. It also tracks the location of all files, allowing new levels of centralized data administration in Unix information systems shops.

"All user files are graded by importance, as indicated by the last time of access," said Max Morton, director of marketing and sales at Discos. "Files that are accessed daily are kept on the most expensive media, which is magnetic disk. Other files are moved off to tape cartridges or to optical discs, where they are archived."

Discos is licensing the software through mainline systems suppliers and has concluded licensing agreements with Amdahl Corp., Control Data Corp., Floating Point Systems, Inc. and Alliant Computer Systems Corp., Morton said.

One beta-test site is the North Carolina Supercomputer Center in Research Triangle Park, N.C. The center, which houses an IBM 3090 running AIX/370, a Cray Research, Inc. Y-MP and a Convex Computer Corp. machine, sought a new file management system to manage 44G bytes of stored data, scattered around various disk drives and tape drives.

"We found that our disk space came at very much a premium [price]," said Jeffrey Huskamp, deputy director at the supercomputing center. "With Unitree, you can set the migration parameters and make sure the least frequently referenced files are stored on the cheapest media."

Lack of control

Unitree moves the Unix files without the direct intervention of the end user, but software developers at Lawrence Livermore said Discos has yet to determine the optimum amount of transparency for end users.

"It's almost too transparent," said Sam Coleman, storage group leader at the lab. "The issue is how much control the users should have over where the files are stored."

Lawrence Livermore, which derives royalties from Unitree sales, is working on enhancements that would allow users to assign priority levels to specific files that could override Unitree's default settings for storage.

Pricing for Unitree varies according to the amount of data to be managed.

An entry-level system handling up to 30G bytes costs $6,250; a system handling up to 560G bytes costs $36,000; and a system handling up to 5,000G bytes costs $95,000.

Traders

FROM PAGE 23

this word processing software.' We just didn't know," McCann said. "We had to move fast but also move cautiously."

In the meantime, the search was on for a back-office trading system. "I don't believe that you choose the hardware before you choose the software," McCann said. "But the timing was tricky." The trading system that was selected ran on Digital Equipment Corp. machines, so LBI purchased a VAX 4000 as its corporate system.

The firm also bought a VAX-based general-ledger system and transferred 18 months' worth of general accounting information from a PC to the VAX in eight minutes. "It didn't drop a decimal point, and the information matched exactly the first time," McCann said.

Merciful memory

Even though the VAX can be considered a proprietary operating system, McCann said she has been "very happy with it since I put it in. It's an excellent operating system from a system management standpoint, and the connectivity options are very, very good." She said the system is "forgiving" — the time someone hit the wrong button, the VAX crashed and was brought up the next morning with no data missing.

Another big decision involved what type of network to bring in. During the early days, office space was being constructed, and "I had to decide, even though at the time it wasn't even in the realm of possibility, about the network," McCann explained. She chose Ethernet and unshielded twisted-pair wiring, the first because she had heard it was the best for connecting different types of computers and the second because of its low cost and flexibility.

"Much as I wanted to do it, I held off putting a network in. I'm glad I did because I would have gone with Novell, and that would not have been the right way to go six months down the line. This way, when we made the decision to get the VAX, the wiring was already there," she said.

During the next year or so, McCann said she will be working on connecting some of the networks together so that the Sun workstations and Macintoshes will be able to access the VAX. One reason is an application that LBI is developing to take information from the back-office trading system and then be able to manipulate the data and analyze it in different ways.

According to McCann, another possibility is upgrading the Macintosh network to an Ethernet system because a planned application will need more network horsepower to run than what is currently available.

McCann said, though, that she still marvels at how far the firm has come technologywise. "And this has all happened in two years. This has been a phenomenal opportunity, to help build what I consider to be an integrated and very sophisticated system for a firm this size."

Users praise HP power, better rapport

BY J. A. SAVAGE
CW STAFF

SAN DIEGO — Hewlett-Packard Co.'s user group meeting recently gave the company an opportunity to make several hardware and software announcements but, most importantly, showed an improving relationship between the vendor and its users, according to user group Chief Executive Officer Chuck Piercey.

Reflecting HP's strong industry position during difficult times for the computer business, Piercey said, more than 3,000 people attended — a higher number than last year. "Last year's meeting was a low point in relations between users and the company. Since then, HP's responded very positively."

The Interex user group had complained loudly last year to company officials about their planned abandonment of HP's older proprietary database and the proprietary MPE 5 operating system. Since that time, HP has established a department to continue support for its "mature" products.

Pumping up the power

At the conference, HP said it would add power to its high-end HP 3000 Model 980/200 with two processors, to a three-way machine, increasing transactions per second from 100 to 150. Also, HP said it will resell the latest fault-tolerant computer from Sequoia Systems, Inc.

On the software side, HP announced four software development tools based on structured query language (SQL) that will allow development on personal computers or workstations using HP's Allbase/SQL database and either Microsoft Corp.'s Windows 3.0 environment or the Open Software Foundation's Motif graphical user interface.

"It gets the PC world to move up into midrange systems," said Korak Mitra, HP's Commercial Systems Division product-line manager. "Before, you had to glue the PC network to the back end by hand."

Several printers were also shown. A high-speed, mainframe-class printer, the 5000 F100, uses LED electrophotographic technology to achieve laserlike quality at 100 page/min. Two small color printers — the Deskwriter C printer for Apple Computer, Inc.'s Macintosh and the Deskwriter C for HP's equipment — were introduced. Both are based on ink-jet technology and print monochrome at 3 page/min. and color at ¼ page/min.

NEW PRODUCTS — SOFTWARE

Utilities

Sterling Software, Inc.'s Systems Software Marketing Division has announced Release 3.0 of Shrink for DB2.

Shrink offers data compression for IBM DB2 databases. Release 3.0 offers a greater compression ratio while reducing overhead on the central processor. Users can control CPU overhead by increasing or decreasing the compression rate. The product also offers a repository for compression analysis records.

Shrink costs $26,500 for a Group 40 processor.

Sterling Software
11050 White Rock Road
Rancho Cordova, Calif.
95670
(916) 635-5535

Technology Management Group, Inc. has announced RAC-Check Version 1.2.

The security software package for the IBM RACF mainframe environment provides an on-line mode for verifying changes to RACF profiles and an off-line mode that periodically tests database security. The product reduces the profile maintenance learning curve as well, the company said.

It operates under RACF Version 1.8 or later on MVS systems. Licensing starts at $3,750, depending on central processor.

Technology Management
Group
Suite 201
2125 112th Ave. N.E.
Bellevue, Wash. 98004
(206) 451-2575

Blueline Software, Inc. has made available a CMS Access Option for use with its Multiterm session manager software.

Multiterm with CMS Access allows users concurrent access to CMS applications while running VTAM sessions in the MVS and VSE environments. The product offers a menu system with help desk facilities and a scripting language.

Monthly license fees range from $380 to $650.

Blueline Software
Suite 690
5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

HARDWARE

I/O devices

DCS Software and Consulting, Inc. has announced the True Fax Solution Pak for the IBM Application System/400 market.

The package includes Release 2.1 of the company's True Fax software bundled with a fax modem. The enhanced software allows users to store received fax documents as AS/400 images and to include signatures and logos in outgoing faxes.

Pricing for the Solution Pak ranges from $1,850 to $8,500. Pricing for software only ranges from $950 to $7,600.

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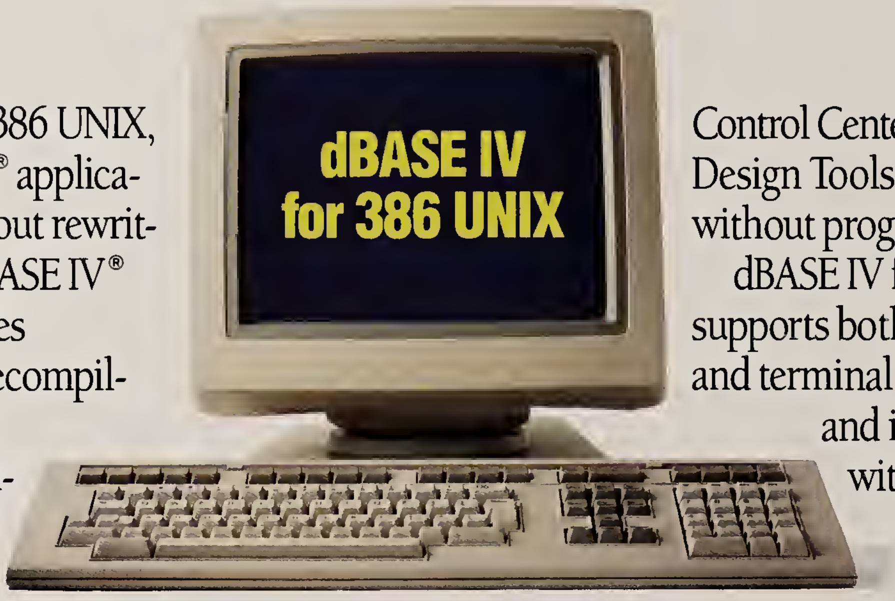

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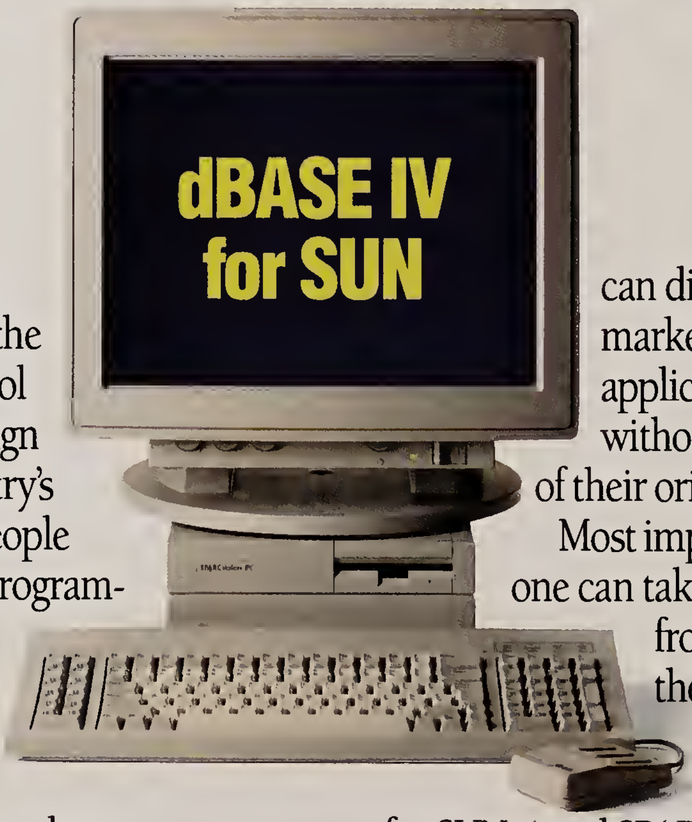

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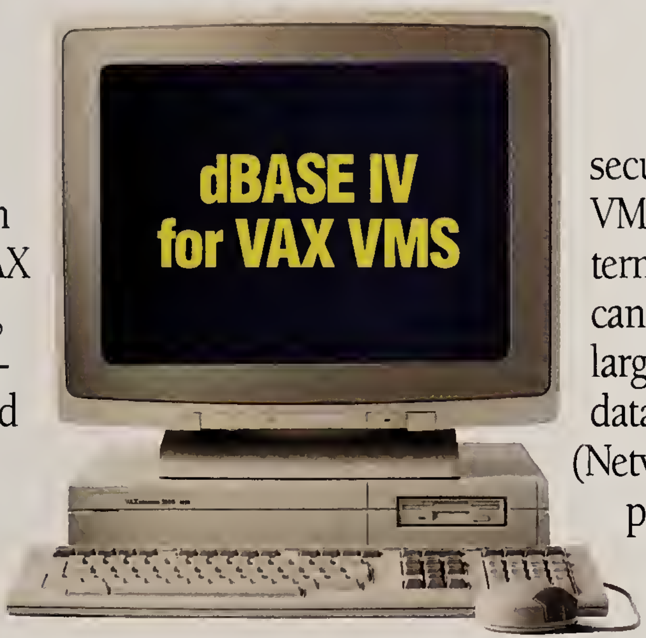

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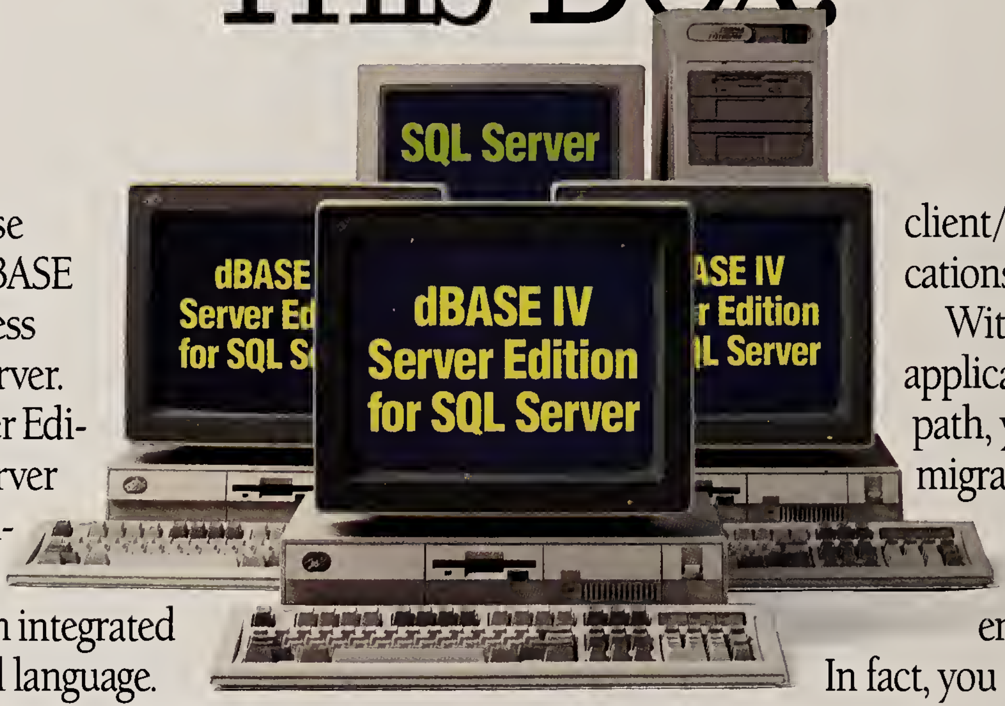
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Claris help on-line

Claris Corp. recently expanded its technical support to **America Online**, a nationwide on-line information service. Subscribers can now access information about Claris 24 hours a day. Claris' technical support staff will also respond within 24 hours to the posting of specific questions. New product information will be listed and updated daily. Also, users can access a Claris software library for usage tips and answers to common questions.

A forum for users of **Next, Inc.** computers has popped up on the **Compuserve Information Service**. The forum is not sponsored by Next. Users will be able to exchange information and consult Next experts via a message board and weekly live conferences. They can also download software and text files from its library.

San Mateo, Calif.-based **Qualix Group, Inc.** recently became the self-proclaimed sole independent marketing organization devoted to marketing and publishing software only for Unix workstation users.

Look what they've done to printers

ANALYSIS

BY CAROL HILDEBRAND
CW STAFF

It may not slice through a tomato or dice the endive wafer-thin, but the way the peripherals market is going, a new type of printer may soon rival a set of Ginsu knives when it comes to added features.

The new printer is bristling with add-on features ranging from copying to fax capabilities. These multifunction machines could pave the way for a commingling of the three markets, which could result in a significant shakeout, according to industry observers.

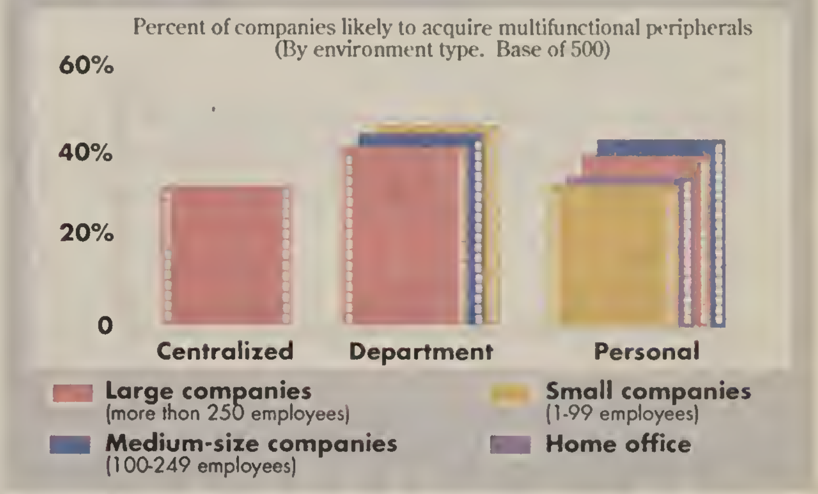
Mass market

Rob Auster, director of the electronic printing group at BIS Strategic Decisions, a Norwell, Mass.-based research company, predicted that the movement toward multifunction devices will result in one large market combining today's current stand-alone printer, copier and fax arenas, although different niches will emphasize the various devices, he said. "Multifunction will come in and cannibalize growth," he explained.

Continued on page 33

Pumped-up printers

Small and medium-size offices will be tempted to buy peripherals that contain multifunctional capabilities



Source: BIS Strategic Decisions

CW Chart: Janell Genovese

Symantec steps in to fix Windows bugs

BY CHRISTOPHER LINDQUIST
CW STAFF

CUPERTINO, Calif. — While Microsoft Corp. works to fix shortcomings in its hot-selling Windows 3.0, some users say a new product from Symantec Corp. has already done that and more. Symantec's Norton Desktop for Windows is sparking praise on Compuserve bulletin boards as "the killer application," and demand for the product already appears to be high.

"Norton Desktop is, in essence, the great unifier of Windows and the operating system," said George Roukas, information systems director at a Fortune 50 company. "It's an incredibly well designed Swiss army knife for computer users."

Norton Desktop can be used to replace both the Windows Program Manager and File Manager applications at start-up and includes features that guard against accidental data loss. The Norton Backup for Windows is also included in the package.

The $149 product provides an enhanced user interface over Program Manager for Windows, including the ability to "drag and drop" files that are acted on by "tools" such as file viewers and print spoolers.

Instead of using Microsoft's unwieldy File Manager, users can simply click on icons to retrieve file lists and directories.

Initial reaction on Compuserve from users of the product was enthusiastic. It was described as "intuitive," and Compuserve users claiming to work for software dealerships were asking Symantec to ramp up their production because the product was selling quickly.

Wish list

Norton Backup for Windows is not perfect, however. "I wish that it supported tape drives," said Robert Cameron, technology director at a large East Coast accounting firm, referring to the backup utility's floppy-only support. Symantec sources on Compuserve indicated that the next version will contain tape backup support.

Some users also complained that using the product as the shell dramatically increased the time it takes to load Windows. Symantec representatives on Compuserve acknowledged this and advised users at start-up to load only tools that would be used often. But users who must frequently switch operating environments may still find the delay annoying.

However, users are reporting few faults and lots of praise for the product. "If this is any taste of technology from Norton for the desktop, we can't wait for Norton Utilities for Windows," said Joel Diamond, a spokesman for the Windows User Group Network in Media, Pa.

Symantec has also announced that a bug-fix version of Norton Utilities will begin shipping to all registered users of Version 6.0 sometime this week. Version 6.01 reportedly fixes "all known and verifiable problems that were recently reported in the media and on bulletin board services."

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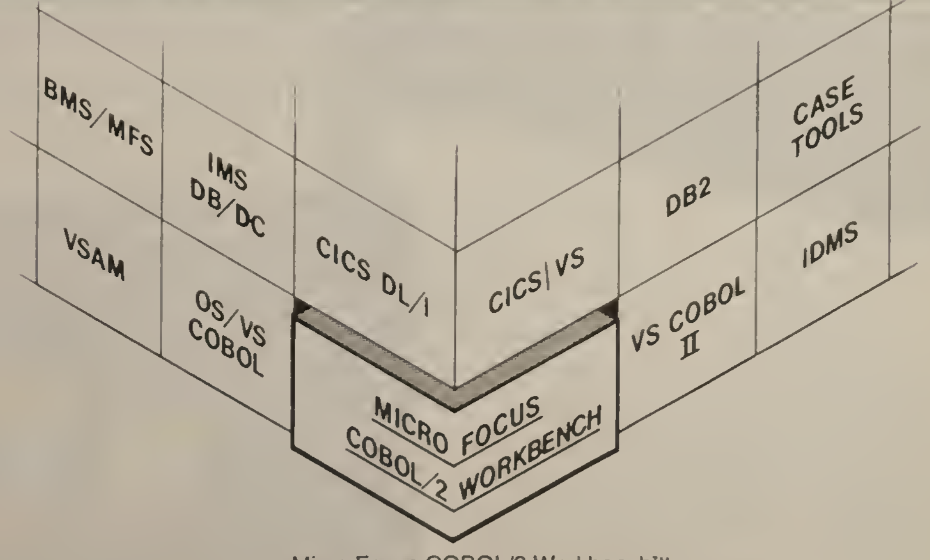

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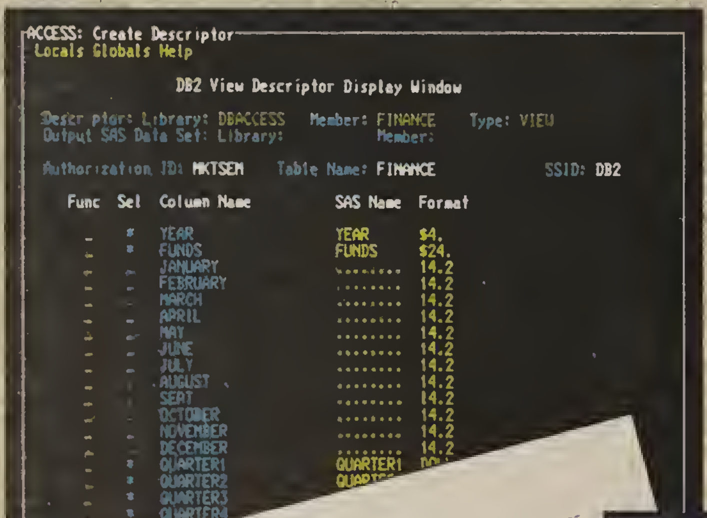

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ACCESS: Create Descriptor
 Locals Globals Help

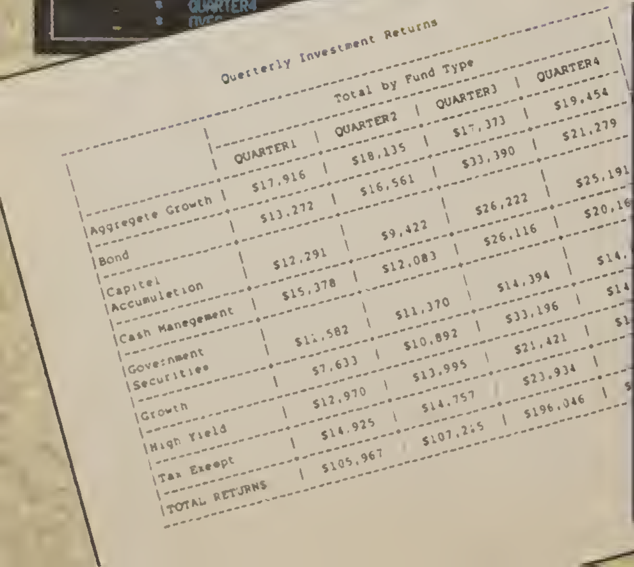
                 DB2 View Descriptor Display Window

 Descriptor: Library: DBACCESS   Member: FINANCE    Type: VIEW
 Output SAS Data Set: Library:          Member:

 Authorization ID: MKTSEM    Table Name: FINANCE            SSID: DB2

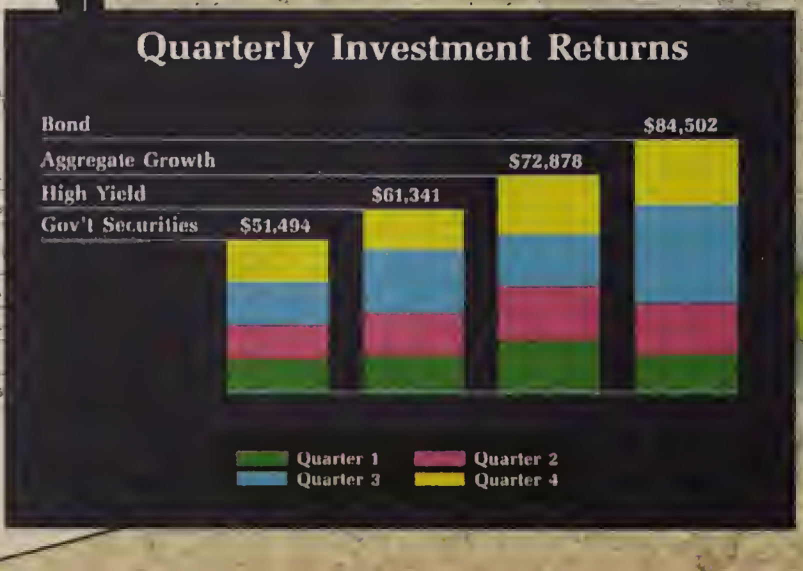
   Func  Sel  Column Name            SAS Name  Format

    _     *   YEAR                   YEAR      $4.
    _     *   FUNDS                  FUNDS     $24.
    _     _   JANUARY                ........  14.2
    _     _   FEBRUARY               ........  14.2
    _     _   MARCH                  ........  14.2
    _     _   APRIL                  ........  14.2
    _     _   MAY                    ........  14.2
    _     _   JUNE                   ........  14.2
    _     _   JULY                   ........  14.2
    _     _   AUGUST                 ........  14.2
    _     _   SEPT                   ........  14.2
    _     _   OCTOBER                ........  14.2
    _     _   NOVEMBER               ........  14.2
    _     _   DECEMBER               ........  14.2
    _     *   QUARTER1               QUARTER1
    _     *   QUARTER2
    _     *   QUARTER3
    _     *   QUARTER4
```



Quarterly Investment Returns

	Total by Fund Type			
	QUARTER1	QUARTER2	QUARTER3	QUARTER4
Aggregate Growth	$17,916	$18,135	$17,373	$19,454
Bond	$13,272	$16,561	$33,390	$21,279
Capital Accumulation	$12,291	$9,422	$26,222	$25,191
Cash Management	$15,378	$12,083	$26,116	$20,16
Government Securities	$11,582	$11,370	$14,394	$14.
Growth	$7,633	$10,892	$33,196	$14
High Yield	$12,970	$13,995	$21,421	$1
Tax Exempt	$14,925	$14,757	$23,934	$
TOTAL RETURNS	$105,967	$107,215	$196,046	



Scanners can give OCR a hand

Handheld devices make optical character recognition more manageable

ANALYSIS

BY JAMES DALY
CW STAFF

Getting printed copy out of a personal computer has usually been easy. Getting printed copy in — well, that's another story.

Differentiating between the letter *S* and the number *5* may be a snap for most people, but it represents a baffling task to a computer, especially if you throw in a variety of typefaces and styles.

One solution thus far has been scanners that use optical character recognition (OCR) technology to "read" nearly any form of printed text and convert it into electronic data, which can then be stored, processed and displayed. Trouble is, these machines often cost several thousand dollars. They also enter in whole pages of text at once rather than specific small images or areas.

Hand-holding

That is where the promise of affordable handheld units comes in. Recently, Caere Corp. in Los Gatos, Calif., introduced what some users said they hope will be the first in a steady stream of OCR-based handheld scanners. Caere's $695 Typist and Typist Plus Graphics, an edition with new graphics capabilities, represent significant advances for a technology that has struggled since it was introduced five years ago. "We're finally seeing products that are not only very good but affordable to the average IS manager," said Kristy Holch, an analyst at BIS Strategic Decisions in Norwell, Mass.

For users, the ability to enter text and graphics into a PC effortlessly and inexpensively may signal a whole new era of productivity. "I'm one of those nuts who gets up at 5:30 in the morning and starts building databases," said Bruce Logan, who publishes several neighborhood publications out of the New York offices of TV Shopper, Inc. "With a product like the Typist, it's like having a secretary available at the crack of dawn."

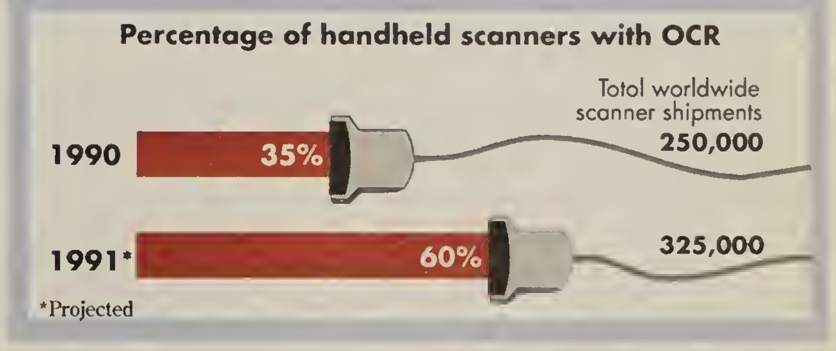
Others said the Typist has freed them from physical constraints. Edward Keegan, director of the computer science facility at Yale University, has a painful case of arthritis in his hands, limiting the amount of time he can use a keyboard. With the Typist, Keegan scans scores of technical articles into a departmental database, which are then passed on to colleagues.

If handheld OCR-based scanners catch on as expected — BIS researchers predicted that 60% of handheld scanners will be sold with OCR capabilities within two years, up from less than 30% today — they could represent the revelation of one of the best kept secrets of the industry.

> "WE'RE FINALLY SEEING products that are not only very good but affordable to the average IS manager."
>
> KRISTY HOLCH
> BIS STRATEGIC DECISIONS

Optical readers have been around since the 1960s, when they were used to read pencil marks on standardized tests and questionnaires. The early technology passed a beam over a surface on which dark marks were made, recording areas too dense for the light to pass through or too dark to reflect the light. The data was then evaluated by a computer.

OCR devices operate on the same principle, scanning a page and creating a digital signal based on dark and light areas. By comparing the scanned images with a library of characters, the OCR identifies specific characters.



High in character
Use of optical character recognition (OCR) is taking off

Source: BIS Strategic Decisions

CW Chart: Janell Genovese

Many retail stores now use optical readers to interpret bar codes made up of vertical lines, varying in thickness, that represent specific characters and numbers. When the optical reader passes a beam of light over the merchandise label, it creates a digital signal based on the lines and the white space between them.

While OCR technology has always been promising, its history has been fraught with frustration. Recognizing an alphabet of various sizes and typefaces was a complex technological challenge.

Early OCR packages would sometimes produce whole pages of random characters or other assorted misreads, bugs and glitches. Suddenly, "The quick brown fox jumped over the lazy dog" becomes "the guick bruun fox jumped overthe lasidog." Problems like that had users wishing they had typed the document manually.

The situation has improved, but getting a scanner and OCR software to work together can still require a little finagling. You need to learn how to "tune" the light and dark settings, know which typefaces will be recognized and develop a sense of what section in a document will fit in the scanner's range.

"The contrast setting is key," said Alex Moffet, owner of Renaissance Herbs, Inc. in Santa Monica, Calif., and a Typist user. "If the contrast setting is off, you wind up with a lot of dots and quotation marks."

After you have acquired the right knack, the results can be impressive, users said. So impressive, in fact, that some software companies are reportedly considering adding OCR capabilities to their operating system software or word processing packages. "One day, OCR could be like a spell checker in a word processor — a feature everyone has and takes for granted," Holch said.

There's a price dip in the air: ALR lowers cost of I486SX

BY CHRISTOPHER LINDQUIST
CW STAFF

The entry fee for high-performance desktop computing recently dropped a little more with Advanced Logic Research, Inc.'s (ALR) announcement of an Intel Corp. I486SX-based system priced at less than $2,000.

"The clones are just going to beat everybody to death," said John Gantz, personal computer editor at *Tech Street Journal*, referring to the latest entry in the price/performance wars. "There's a market for cheaper and faster."

The $1,995 Businessstation 486ASX uses the Extended Industry Standard Architecture (EISA) bus and includes a built-in Intelligent Drive Electronics disk controller and 1,024- by 768-pixel resolution display capability. It also includes security features such as a hardware key lock and dual-level password protection. The slimline case contains five expansion slots, including two 32-bit EISA slots.

The system supports ALR's "just upgrade the CPU" architecture, allowing users to upgrade as high as a 50-MHz 486. The Businessstation 486ASX is available with an 80M-byte hard drive for $2,995.

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SPF/2 takes advantage of OS/2's powerful features. It uses virtual memory to handle very large files. In addition, HPFS (High Performance File System) long file names are supported. And **SPF/2** uses OS/2's REXX for its macro language—75 mainframe-compatible ISREDIT edit sub-commands provide the interface.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. **SPF/2** processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. **SPF/2** even displays the same status indicators.

SPF/2 has features not available on the mainframe. For example, **SPF/2** supports 48 PF keys, automatically adapts to the various OS/2 video modes (full-screen or text-window), and scrolls the file as you move the cursor. In addition, **SPF/2** has virtually instantaneous response time, 100% system availability, and no connect-time charges.

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CC:Mail: Modular structure simplifies use

Technology Analysis — A roundup of expert opinions about new products. Summaries written by New Products Writer Derek Slater and Senior Editor Michael Sullivan-Trainor.

Lotus Development Corp.'s CC:Mail received more than just a cosmetic face-lift when it was redesigned for operation under Microsoft Corp.'s Windows 3.0, reviewers reported. The Windows version of the electronic mail package implements a new, modular structure that simplifies customization and integration with other programs.

Ease of use: Dialog boxes simplify use, and reviewers said messages are easy to create and route.

Administration features: Staff administrators control public mailing-list directories as well as security features including lockouts.

Message handling: Windows' Multiple Document Interface enables users to cut and paste information among several open messages.

Compatibility: CC:Mail offers gateways to numerous mail systems and remote services.

Value: At $495 for the basic CC:Mail Windows Platform Pack, plus $595 for a license that covers up to 25 users, CC:Mail is not cheap. However, reviewers rated it a very strong, full-featured E-mail package overall.

Lotus Development Corp.'s CC:Mail

Reviews	Ease of use	Administration features	Message handling	Compatibility	Value	Overall
Byte 3/91	A bit kludgey	Not easy to use	Slow in Windows	Painless	NC	Straight-forward
PC Magazine 7/91	Easy Windows interface	Efficient	Powerful features	A number of options	Not least expensive	Handles multiple documents well
PC Week 5/27/91	Excellent use of GUI	Good	Good	Good	NC	Good use of Windows
PC World 2/91	Much easier	NC	Easy	Works interchangeably	NC	Hot connectivity options
Users						
Oliver Picher, Datapro Research Group	■	■■■	■■■	■■■	NC	Menus are inconsistent
Bill Lawrence, Southern California Edison Corp.	■■■■	■■■■	■■■■	■■■	■■■	More flexibility under Windows
Analysts						
Janet Mann, Faulkner Technical Reports	■■■■	■■■	■■■■	■■■■	■■■■	One of the richest products
John Dunkle, Workgroup Technologies, Inc.	■■■	■■■■	■■	■	■■■■	Very competitive
David Marshak, Seybold Office Computing Report	■■■	■■■	■■■	■■■	■■■■	Best Windows interface

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Alfred Tobia, Mabon, Nugent	■■■■	■■■■
Wendy Abramowitz, Argus Research Corp.	■■	■■

Lotus Development Corp.'s net income for the second quarter of 1991 was $9.1 million, compared with $23.5 million in second-quarter 1990. Revenue for the same period was $186.4 million in 1991, compared with $175.2 million in 1990. Lotus purchased CC:Mail in February 1991.

Lotus responds

Chuck Stegman, product manager:

Message handling: Dynamic Data Exchange support is in beta testing and will be announced soon. We'll also add a highlighting feature and archiving for copying messages off the server to disks.

Compatibility: The Windows product is based on a Mail Engine written in C++, so it is object oriented and easily portable to other platforms.

Da Vinci Email: Powerful and easy to use

Da Vinci Systems Corp.'s Da Vinci Email for Windows is a powerful multiplatform package designed with simplicity in mind. But, according to reviewers, it lacks features that are standard with most electronic mail packages.

Ease of use: Logon screens that are available at the click of a mouse or the touch of a key give users instant access to Da Vinci. But the package lacks folders and does not take full advantage of the Microsoft Corp. Windows 3.0 interface, *PC Week* said.

Administration features: User-directed security features are included, and administration is easy, especially on a Novell, Inc. Netware network.

Messaging handling: Da Vinci relies on the widely used Message Handling System transport protocol, which *PC Week* found to be difficult and time-consuming to install.

Compatibility: The package supports Dynamic Data Exchange (DDE), which allows it to work well with popular DDE applications. Macros and scripts for some of the main DDE applications are included in the product.

Value: Version 1.8 is priced at $1,495 per server, with each server capable of supporting up to 100 users. Da Vinci is an easy-to-use package for large sites, particularly those with Novell networks.

Da Vinci Systems Email 1.8

Reviews	Ease of use	Administration features	Message handling	Compatibility	Value	Overall
Byte 3/91	Clean	Requires user encryption	Customizable	NC	NC	Functions where you expect them
Infoworld 6/4/90	Very good	Very good	Very good	Good	Very good	6.1*
PC Magazine 11/27/90	Little training required	NC	Plenty of muscle	Transparent	NC	Ease-of-use champ
PC Week 5/27/91	NC	Good	Needs improvement	Good	Good for basic E-mail	Showing its age
Users						
Dennis Eccleston, New York Power Co.	■■■■	■■	■■■	■■■■	■■■■	Highly functional
Kevin Morris, Utah Department of Corrections	■■■■	■■	■■■■	NC	■■■	Real simple, needs text formatting
Bob Fischer, Anixter Brothers, Inc.	■■■■	■■■	■■■	■■■	■■■	We're happy with it
Manager at an East Coast telecommunications company	■■■■	■■	■■■■	■■■	■■■■	Full-function system for good price
Analyst						
Ed Falkowitz, Thorn EMI	■■■	■■■■	■■■■	■■■■	■■■	Very intuitive, needs folders

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating of Version 1.6 based on 1-to-10 scale.

Vendor background information

Da Vinci Systems Corp. is located in Raleigh, N.C. The privately held company was established in 1985 and has 54 employees. Da Vinci Email for Windows provides 89% of the company's revenue, and the remainder comes from related products. The company reports that there are 385,000 users of the package. Novell, Inc. has a minority investment in the firm and a representative on the board of directors. Da Vinci, which does not release financial data, is profitable and revenue is growing, according to the company.

Da Vinci responds

Chris Evans, vice president of marketing:

Ease of use: The next version, 2.0, will feature an advanced folder system. It will offer users Multiple Document Interface, but in a way that won't give them more windows than they can manage.

Message handling: Novell released a new version of Message Handling System this summer that is much easier to install and operate.

Printers

FROM PAGE 29

With a copier market devoted largely to replacement efforts, a fax market that is approaching saturation and a printer market dominated in several segments by Hewlett-Packard Co., vendors are being driven to cram in extra features in order to avoid cutting prices, boost margins and gain market share, according to Auster.

Agreeing that multifunctionality is by no means user-driven, Jim Nichols, proprietor of Station Graphics in Carrollton, Texas, said, "It's going to happen only because the manufacturers are going to want it and do it. Once it's available, users will buy it that way. I don't think end users are saying, 'Well, I'd buy that printer if it had a fax.' "

Other roles

While the popular combinations will be some amalgamation of printers, copiers and fax machines, scanners and digital voice features will also play a role, analysts said. Information Publishing Corp., a Houston-based research firm, predicted that voice and fax integration will more than double the fax market by 1995.

> PRODUCTS AIMED AT bridging the gap between today's single-service devices and the new wave of integrated boxes are beginning to trickle into the marketplace.

Products aimed at bridging the gap between today's single-service devices and the new wave of integrated boxes are beginning to trickle into the marketplace.

A good example would be HP's fax/copier add-on for its popular Laserjet series of printers. While not an integrated multifunction printer/fax, the Laserjet Fax adds plain paper fax capabilities as well as scanning and convenience copying: A document scanned into memory can be duplicated up to 99 times at the normal engine speed of the Laserjet. The Laserjet Fax is not currently suitable for networked use, but predictions are that as a first step into the multifunction market, network-capable products should arrive shortly.

More full-fledged multifunction offerings have made their appearance in the low end, midrange and high end of the market. Early entrants include the following:

- Xerox Corp.'s Docutech is a digital copier, printer and scanner that works at a rate of 135 page/min. at 600 dot/in. It prints paper sizes up to 11 by 17 in. as well as double-sided, or duplex, pages.
- Eastman Kodak Co.'s Lionheart is a 92 page/min., 300 dot/in. LED printer/copier.
- Kodak's 7016 is a 16 page/min. printer and a 6 page/min. copier.
- Everex Systems, Inc.'s Laserscript Fax is a 6 page/min. Postscript printer with plain paper fax functionality.

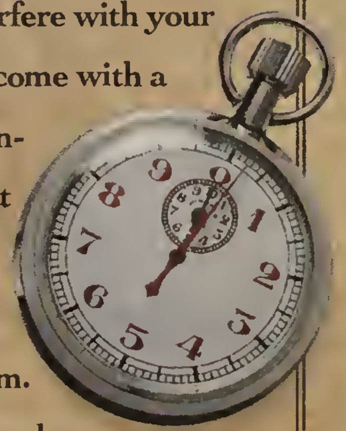
Although many analysts agreed that office automation will result in the combination of many functions, forecasts for implementation vary.

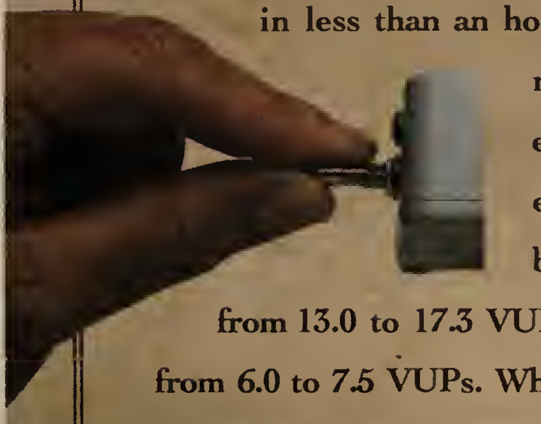
Missing link

According to Ed Pullen, director of printer market information at Computer Intelligence/Infocorp in Santa Clara, Calif., users already owning the various disparate elements of desktop automation need software, not overstuffed hardware. "The piece that is missing is an easy-to-use multifunction hard copy I/O device," he said.

Drawing an analogy between this missing link and data communications software, Pullen said that he is looking for a software manager that can easily pull together faxes, printers and copiers and act as a gateway for them.

Pullen said he can see turnkey multifunctional products coming in from the low end, as represented by home offices and frequent travelers. "For home office systems, they have to think about convenience," he explained.





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CW 8/19/91

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Unix gets head of steam

BY PATRICIA KEEFE
CW STAFF

The oft-derided Unix operating system, in its varying forms, has begun to creep onto the Fortune 1,000 desktop — and not just where information systems managers have given up in disgust over the Windows vs. OS/2 wars.

Recent interviews with a number of Unix users and analysts indicated that the thawing of corporate attitudes toward Unix can be attributed to a number of market changes that have taken place during the past several years:

- **Unity.** AT&T and its two biggest rivals, Sun Microsystems, Inc. and the alliance of Microsoft Corp. and The Santa Cruz Operation, agreed to merge two leading Unix standards — Unix System V and University of California at Berkeley's Unix 4.2.
- **The Open Software Foundation** (OSF). On the one hand, OSF threatened to derail AT&T's efforts to corral the mounting distillations of Unix System V by adding yet another voice to the chorus of Unix choices. But OSF has provided further impetus for standardization. It also did what AT&T could not: brought Unix the blessings of laggards and office giants IBM and Digital Equipment Corp.
- **Intel Corp.'s 80386 and I486 microprocessors.** Unix became viable on Intel computers when those boxes gained powerful chips that enabled them to butt heads with low-end workstations. They have also helped to create another market: superservers. This has helped to force down the price of low-end workstations to the point where they can be considered for office use.

Some Unix vendors, including Sun, embraced the Intel platform (however briefly), weakening the axiom that the platform dictates the operating system.

- **OS/2.** Just as users were casting about for ways to exploit their more powerful desktops, Microsoft and IBM turned them on to the idea of a multiuser, multitasking communications and graphically oriented operating system. Then they failed to deliver. While Microsoft turned away, some users turned to Unix.
- **Applications.** As Unix purveyors began to sing with one voice, or at least in harmony, some major third-party DOS developers such as Autodesk, Inc., Lotus Development Corp., Novell, Inc. and Wordperfect Corp. began porting their popular programs to Unix. This has not yet had a major effect on the Unix desktop market, but it could broaden the appeal of the Unix operating system to DOS users.
- **Databases.** Users have become increasingly enamored of databases, many of which were initially available under Unix. This is an area where Unix has a definite head start and is thought by some to have an overall advantage over OS/2.

Catapult aims to ease data transfer from mainframes and minis to PCs

BY CHRISTOPHER LINDQUIST
CW STAFF

Getting information from a mainframe or minicomputer to users' personal computers easily and in the needed format can be a difficult task. Catapult, a file access application from Bothell, Wash.-based Tangent Group, Inc., might make the job easier.

Using a series of menus, users can capture ASCII text files from a host system, define a "mask" that determines what data should be taken from the files and translate the resulting data into a common PC format.

Hal Bradford, a communications specialist at Centex Corp., a holding company in Dallas, has been evaluating Catapult for use in field operations. His company has been using a communications package to transfer files from IBM System 36s to remote sites.

However, Bradford said, Catapult is faster and more reliable than the current method. He said he hopes the result of using Catapult will be lower phone expenses.

He added that Catapult is easier to use than the present system — a criteria he considers important. "Most of our end users are not there to worry about coding and things like that on a PC," he said. "They're there to build buildings."

Batch files can be created that totally automate the system for the end user, and no real coding is required to get the system working. "We try to get things that are as user-friendly as is possible," Bradford said.

The $495 Catapult requires at least an IBM Personal Computer XT or compatible with 640K bytes of random-access memory, DOS 2.1 or later and a terminal emulation package appropriate to the host system.

XXBench scrutinizes platforms

LOS ANGELES — Those who buy personal computers in volume and who are looking for a tool to compare hardware platforms may find what they need in a recently announced product from XXcal, Inc.

XXBench Version 1.1 is an automated analysis and benchmarking application for Intel Corp. 8086-, 80286-, 80386- and I486-based systems. The benchmark uses "real-world" applications — Lotus Development Corp.'s 1-2-3 Version 2.01, Microsoft Corp.'s C Version 5.1 and Microsoft Word Version 5.0, Microrim, Inc.'s R:Base for DOS Version 2.0 and Ashton-Tate Corp.'s Dbase IV Version 1.0 — to evaluate system performance.

XXBench performs the evaluations by leading applications through a series of operations and timing the results. These results are timed in 1/100-sec. intervals, and reports are created in an ASCII format that can be ported to 1-2-3 for further analysis.

The product is available for a onetime licensing fee of $2,500. If the test results are to be published, a fee of approximately $750 is required for XXcal certification.

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NEW PRODUCTS

Systems

NEC Technologies, Inc. has unveiled the Prospeed 486SX/C, a 16.8-pound color display laptop computer.

The portable computer supports 256 colors as well as Super VGA display at 640- by 480-pixel resolution. In addition, the Prospeed 486SX/C provides a full Extended Industry Standard Architecture expansion slot.

Pricing for a Prospeed 486SX/C equipped with a 120M-byte hard drive is $8,999.

NEC Technologies
1414 Massachusetts Ave.
Boxboro, Mass. 01719
(508) 264-8000

Packard Bell's PB386SXNB *is a full-screen Intel Corp. 80386SX-based notebook computer that weighs in at just 7.3 pounds*

Packard Bell Electronics, Inc. has introduced a new notebook computer based on the Intel Corp. 80386SX chip.

The PB386SXNB standard configuration includes 2M bytes of random-access memory and a 40M-byte hard drive. The system weighs 7.3 pounds and offers a backlit IBM Video Graphics Array display.

The unit costs $3,995.

Packard Bell Electronics
9425 Canoga Ave.
Chatsworth, Calif. 91311
(818) 773-4400

Software applications packages

Businessvision Management Systems, Inc. has announced a new version of Businessvision II, a personal computer-based accounting package for small businesses.

Businessvision II incorporates accounting functions from general ledger to inventory, sales analysis and payroll. The update includes advanced graphics and a file compression feature that reduces required hard disk space.

The price is $225.

Businessvision Management Systems
Suite 401
140 Allstate Pkwy.
Markham, Ontario, Canada
L3R 5Y8
(416) 475-2767

Peripherals

Dataproducts Corp. has unveiled a nine page/min desktop laser printer.

The $2,995 LZR 960 incorporates Postscript Level 2 software from Adobe Systems, Inc. and a reduced instruction set computing-based processor. It provides connection ports for Apple Computer, Inc. and IBM-compatible systems.

Dataproducts
6200 Canoga Ave.
Woodland Hills, Calif. 91367
(818) 887-8000

Calcomp, Inc., a subsidiary of Lockheed Corp., has announced a $2,000 price reduction and enhancements for its Colormaster Presenter printers.

The price for the thermal transfer printers is now $2,995. The random-access memory has been raised from 512K bytes to 1.5M bytes, and an interface that allows the printer to emulate a plotter for use in computer-aided design applications has been added.

Calcomp
2411 W. La Palma Ave.
Anaheim, Calif. 92801
(714) 821-2000

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digital update

NEWS AND VIEWS AUGUST 1991

FDDI: SUPPORTING THE NEW WAVE OF LAN DEMANDS

As today's proliferation of systems, users, and network-intensive applications continues, Fiber Distributed Data Interface (FDDI) is fast becoming the preferred interconnect — much as Ethernet has proven to be the choice for mid-speed LANs, workstations, and terminals.

Why FDDI?

Because FDDI complements existing network technology. It doesn't replace mid-speed LANs, such as Ethernet/802.3 or Token Ring/802.5. Instead, it integrates with them and augments their capabilities. An FDDI network may operate as a dedicated communications channel, such as a workgroup network. Or it can serve as a high-speed backbone interconnecting several mid-speed subnetworks.

Supporting network data rates of 100 megabits per second, FDDI readily accommodates distributed computing architectures and provides a platform for network-wide services and network-intensive user applications. It is used to create networks of greater geographic span than mid-speed LANs and to support the heavy network traffic of high-powered computers and workstations.

Standard Choices in Fiber Media

The American National Standards Institute (ANSI) spent nine years developing a practical industry-consensus standard for high-performance networking utilizing fiber media for FDDI.

The first media defined for FDDI was multi-mode fiber optic cable, offering high bandwidth, high performance, light weight, and physical security, as well as immunity from electromagnetic and radio frequency interference. This fiber-based connection allows up to two kilometers between FDDI stations, with a maximum network circumference of 100 kilometers.

The first alternative media defined by ANSI is single-mode fiber. It can support distances of up to 40 kilometers between FDDI stations.

And Now Non-Fiber Media

At the same time, there is increasing interest in copper media for FDDI. Two such alternatives are Shielded Twisted Pair (STP) cable and ThinWire coaxial cable.

As FDDI expands to desktop systems, copper-based FDDI offers two significant advantages over fiber-based FDDI — the ability to use existing ThinWire and STP cable plants, and a significant reduction in cost per connection.

> **"DEC's FDDI solution is flexible, fast, well-designed, and most importantly, cost effective."**
>
> ***LAN Magazine*, January 1991, naming Digital's FDDI its Fiber Optic Network Product of the Year.**

DIGITAL'S FDDI SOLUTIONS

Still the Performance Leader in Open Networks

Recent product announcements have kept Digital in the industry forefront when it comes to FDDI solutions. No other vendor offers such a complete FDDI solution set or range of options.

With Digital's FDDI products, you can easily add this high-performance networking capability in a staged process — growing in pace with your business, protecting your systems investments along the way. Here's a quick overview to highlight some of the newest members of our FDDI product family:

DECbridge 500 Series
DECbridge 600 Series

The DECbridge 500 and 600 Series are standards-compliant LAN interconnect devices that join Ethernet/802.3 and FDDI LANs. The complete series includes 13 new DECbridge products to meet most LAN-to-LAN interconnect requirements.

Communication between Ethernet/802.3 and FDDI LAN technologies is accomplished through a standards-based translation capability.

One important new feature: the new DECbridge 600 Series are multiport Ethernet-to-FDDI bridges. Other new features in the DECbridge 500 and 600 Series include:

- Dual Attachment Station (DAS) options, providing direct attachment of DECbridge devices to the FDDI LAN without a concentrator.
- Support for dual homing and external optical bypass.
- Single-mode optical fiber FDDI options.

DEC FDDIcontroller 400

The DEC FDDIcontroller is Digital's communications adapter for VAX 6000 and VAX 9000 systems. It allows either VAX system to participate as a Single Attachment Station (SAS) device in a high-speed FDDI network.

This high-performance adapter uses an ANSI standard Media Interface Connector (MIC) to directly connect to any ANSI standards-compliant FDDI concentrator, such as the DECconcentrator 500.

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continued ➤

➤ FDDI continued

FDDI Copper Options: DEC FDDIcontroller 700-C DECconcentrator 500

To meet the expansion of FDDI to the desktop, Digital has taken a leadership role in delivering FDDI on copper-based media.

Our recently announced copper options allow TURBOchannel-based systems, such as DECstation 5000 systems, to connect to the FDDI LAN over 100 meters of either ThinWire or STP cable.

The copper options feature a low cost per connection, and permit the use of installed Ethernet and Token Ring cable plants for FDDI. The product set includes:

- A new variation (DEC FDDIcontroller 700-C) of the adapter for the DECstation 5000 and DECsystem 5000 TURBOchannel-based workstations; the adapter is switch selectable between either 150-ohm Type 1 or Type 2 STP, or 50-ohm ThinWire coaxial cable.
- Two new six-port option modules for the DECconcentrator 500, including a port card for STP cable and a port card for ThinWire coaxial cable.

DECmcc Extended LAN Manager V1.0

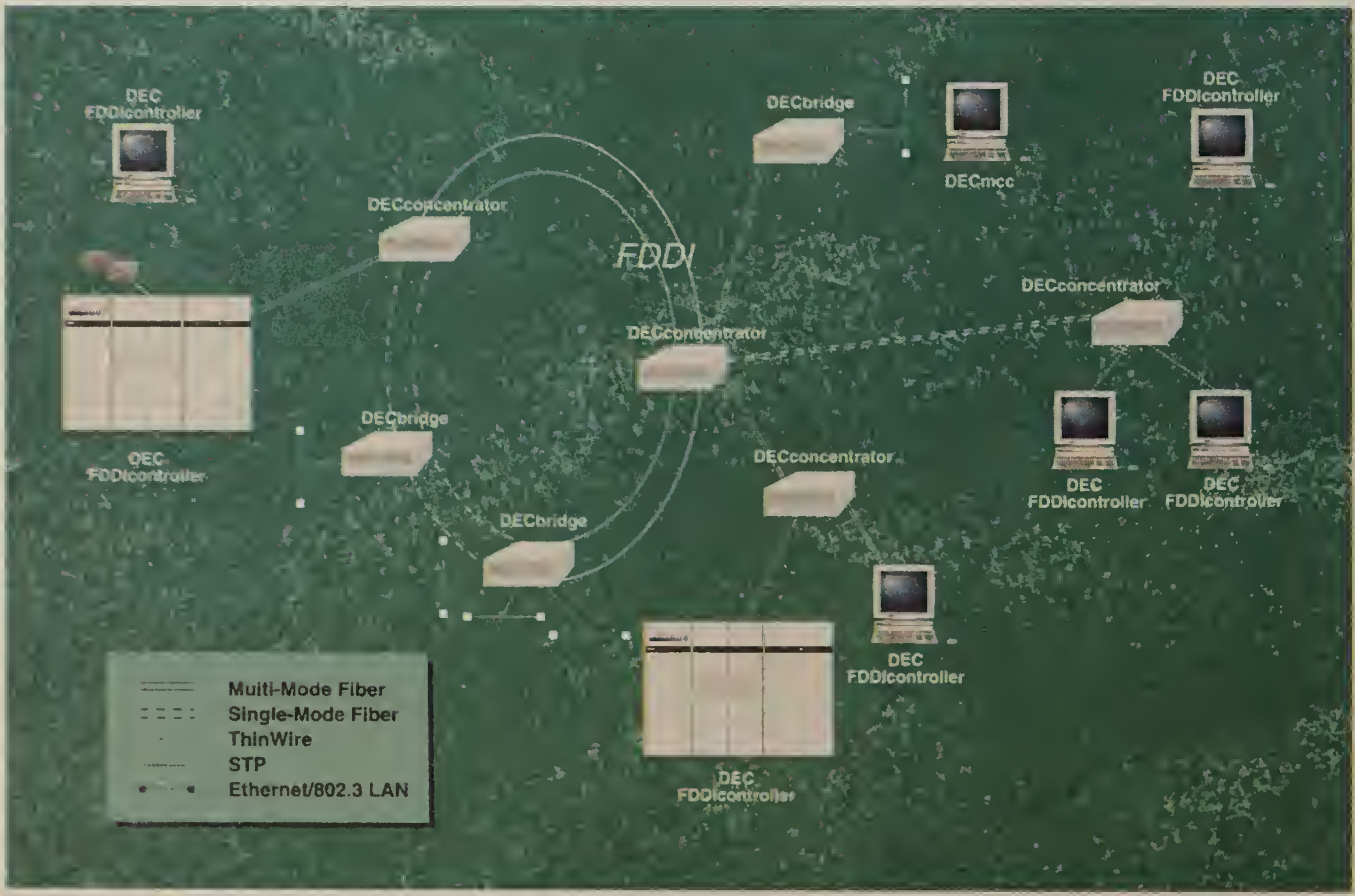
The new DECmcc Extended LAN Manager provides network management for new and existing Ethernet/802.3 and FDDI products via the EMA-compliant DECmcc Director family of products.

The DECmcc Extended LAN Manager allows you to manage all Digital FDDI and Ethernet/802.3 bridge products, as well as DECconcentrators, from any DECmcc configuration.

With it, a network manager can configure, monitor, control, or troubleshoot the FDDI network from a single station, as well as implement many important bridge and concentrator functions.

For more information and product specifics on Digital's FDDI solutions, contact your local Digital sales representative. Or call our Technical Consulting Center at 800-343-4040, ext. 707.

Digital's FDDI solution set provides maximum flexibility in the design and implementation of an FDDI network.



NEWSFLASH

LA324 Multiprinter: It Works as a Keyboard Send/Receive Device

Did you know you can configure the VT420 terminal to pass all keyboard commands directly to the LA324 Multiprinter? Using the easy VT420 set-up feature, you can place the VT420 in either Controller or Auto Print mode. Controller mode allows you to type commands from the VT420 keyboard to the Multiprinter, emulating a Keyboard Send/Receive (KSR) device. Auto Print mode passes all data from your host to the VT420 video screen, and then passes that data directly to the Multiprinter.

Figure on some savings too. Combined cost for the VT420 and the LA324 equals approximately $2,624, while the base price of the LA120 KSR printer alone runs $3,424.

X.400 Means Savings from Sprint

Thanks to a recently announced worldwide program from Sprint and Digital Equipment Corporation, Sprint will waive X.400 destination charges for three months for all customers who purchase Digital's X.400-based electronic messaging products. Digital customers will receive X.400 service via SprintMail electronic messaging service. Access to millions of telex and fax users around the world will also be available through SprintMail.

Extending through December 1991, the program applies to those who purchase Digital's Message Router X.400 Gateway (MRX), ALL-IN-1 MAIL, and DEC X.400 Mail for ULTRIX electronic messaging products.

Get the Best for Less: Save 50% to 80% on Reliable Spare Parts

If you maintain a variety of Digital products, the "Best for Less" program presents the opportunity for you to stock up on spare parts at reduced prices.

Call 800-225-5385 to find out if we have the parts you need in our current inventory.

If we do, we'll quote you a price. And you can place your order. It's that easy. Delivery is quick, with orders shipped within 48 hours of placement.

This offer is available only through the above toll-free number. It's not available through DECdirect or any other ordering channel. All spare parts are sold at shippable revision level and have a 90-day Digital warranty.

Digital Support
equals
MULTIVENDOR Support

These days, nearly every major service vendor is proclaiming, "We have multivendor service." What differentiates Digital from all the rest?

Here, John Rando, Manager, Digital Product Services, addresses that question, as he discusses how Digital is taking a leadership role in offering open services.

John Rando
Manager,
Product Services
Digital Equipment
Corporation

What gives Digital a competitive edge in the multivendor support arena?

Digital continues to take a leadership role in setting standards in the industry, and that certainly carries through to our service organization. In order to support today's open systems architecture, we have to complement that with the right open services.

Multivendor service is important to Digital — because it's so important to you. Today we service over 8,000 products supplied by over 800 vendors worldwide. And that's not limited to hardware products. In fact, one of our highest growth service areas is multivendor software consulting and support for independent software vendor applications.

As for service delivery, our capacity reaches across the globe — with over 43,000 employees in the services organization, 26 customer support centers, and 42 application technology centers.

All that infrastructure can be utilized and leveraged to deliver the same support with other vendors' products as we've been bringing to our own products for well over 30 years.

When you say you offer multivendor service, do you mean *ALL* vendors *ALL THE TIME*?

Keeping our objectivity is important, as is maintaining the quality of our support. Like every other company, we're under pressure to grow, to be profitable — but not at the risk of sacrificing our customers' operations.

So sometimes if we can't provide a service, or can't find a partner to provide it, we do have to say "no" to you. That takes discipline throughout our organization.

What do you do to ensure the quality of your multivendor service and support offerings?

To continue along the lines of what I was just saying, we're obligated to take on business where we can realistically meet your needs and expectations. That principle sets certain standards for quality.

Of course, we're always looking for feedback from our customers — our own surveys, outside surveys, benchmarks, any way we can gain information on where we stand now and what we can do to improve the quality of our support.

Training is also a top priority. We strive to keep our own employees, as well as third-party partners, all involved in education and training. It's an ongoing process. Today, Digital offers global education and training in 16 languages (and another eight on demand) to more than 330,000 customers and staff annually at customer sites as well as at our 145 training locations worldwide.

Do you see customers with no Digital products choosing Digital service?

Absolutely. Our entire desktop service business is built on that very premise. Right now, we're servicing thousands of non-Digital PC products. Desktop products from every vendor you can name that has any kind of established leadership in the PC world are being serviced by Digital today.

How does Digital deal with the "finger-pointing" problem that often arises in a multivendor environment?

The best way to eliminate that is to develop solid relationships with all partners and suppliers up front. Digital's been doing business that way for years. We readily position ourselves as your single point of focus. That's because we're used to working with multiple vendors, and we have the confidence to assume the risk — knowing we've built the right kind of relationships.

We work with all vendors involved to iron out any differences behind the scenes — so the terms and agreements meet the expectation that you, the customer, come first.

How do you "package" your multivendor services?

I think it's fair to say our breadth of multivendor support capabilities is setting industry standards. We offer a range of support — from point-product solutions, to the most comprehensive levels of management and support for systems integration. Quality and flexibility are inherent across our services spectrum.

We'll work with you to plan, design, implement, and manage a service solution that is designed to meet your unique needs today, growing as you grow.

We have consulting services that evaluate work loads and provide situation solutions. Our worldwide training organization assists customers in designing tailored training programs. In the maintenance mode, our applications projects team focuses on tailoring Digital and non-Digital hardware and software to work together in your environment. We offer complete network management services, on up to handling the full outsourcing of data centers and telecommunications capabilities. And the list continues to grow.

> **"... our breadth of multivendor support capabilities is setting industry standards ... Quality and flexibility are inherent across our services spectrum."**

And what about future directions?

We're moving ahead with confidence, recognizing that support and service solutions will drive the industry in the years ahead. The right type of support can help you ease through the move to open systems. The right type of support can help you protect investments, manage risk, and increase productivity, while allowing you to focus on your core business.

Digital Services has the experience, the worldwide capabilities, and the partner relationships necessary to succeed in the multivendor business. We're setting the standards for open services. Work with us. We are prepared to support and service your multivendor solutions — now and into the future.

A View of VES: In Support of Multivendor Equipment

Vendor Equipment Services (VES) began eight years ago — in response to a small handful of customers requesting Digital service on non-Digital hardware products.

Today, Digital's multivendor services portfolio has more than 8,000 non-Digital products from over 800 vendors. A large portion is indeed hardware products, including data communications, terminals, printers, disks, and tape drives — from vendors like StrataCom, Fujitsu, Kennedy, Maxtor, and Seagate. (Our VES hardware-support program is complemented by our Vendor Application Services (VAS) program for multivendor software support.)

As local area networks grew in popularity, we expanded our multivendor service to include most PCs, such as those from IBM, COMPAQ, and Apple. Soon systems from Sun, Apollo, and Wang, among others, were added to our growing service list.

Judging from a recent study done by The Ledgeway Group, customers looking for multivendor support are interested in working with a vendor that can offer experience, in-depth capabilities, and quality service.

Digital certainly meets these criteria.

If you have questions regarding the service of specific non-Digital products at your sites, call your local Digital Services office today.

DEC SoftPC

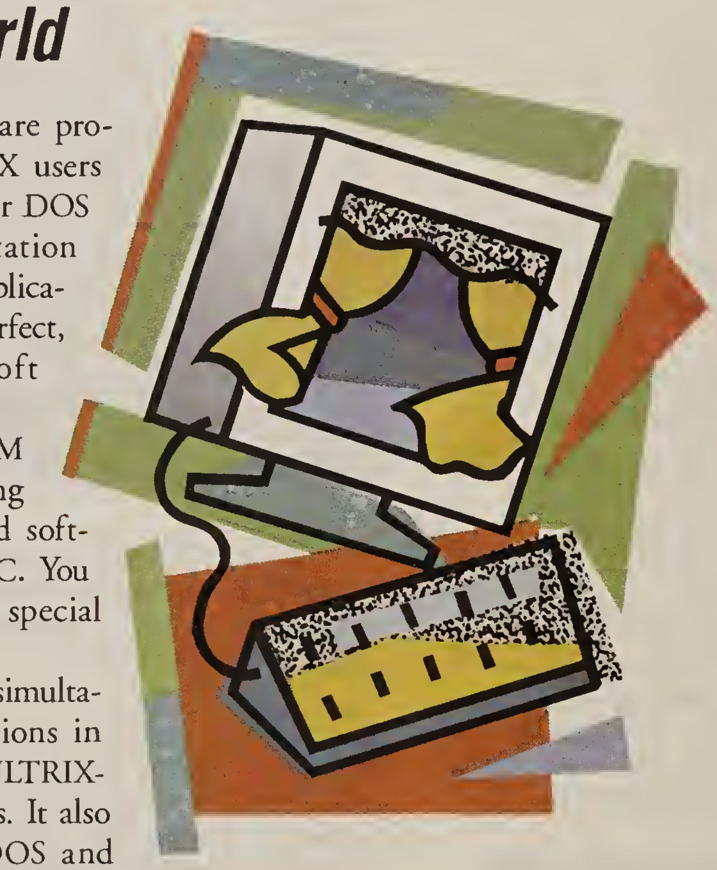
Opening Your Workstation Window on Today's PC World

DEC SoftPC Version 2.2 software provides VAX VMS and RISC ULTRIX users with the ability to run most popular DOS applications. It's ideal for workstation users who need access to DOS applications, such as Lotus 1-2-3, WordPerfect, Harvard Graphics, and Microsoft Word.

DEC SoftPC emulates an IBM Personal Computer AT system using standard workstation hardware and software. Your workstation acts as a PC. You can execute DOS commands; no special hardware is required.

DEC SoftPC allows you to work simultaneously with DOS-based applications in one window, and VMS-based or ULTRIX-based applications in other windows. It also lets you transfer files between DOS and either ULTRIX or VMS. You can even run multiple DEC SoftPC windows, accessing several PC applications at once.

Order DEC SoftPC today for the best of both worlds: the power and versatility of a workstation, *and* the accessibility to your favorite PC application.



To order a first-time DEC SoftPC license, contact your local Digital Sales office, or call 800-DIGITAL (800-344-4825). To update your current version of DEC SoftPC, contact your local Digital Sales office.

And keep in mind that DEC SoftPC is also supported on other Digital VAX VMS and RISC ULTRIX systems, including DECstation, DECsystem, VAX, MicroVAX, VAXstation, and VAXserver systems. Call 800-DIGITAL (800-344-4825) for more information.

Product Description **Single-User License**	**Order Number**	**List Price**
DEC SoftPC for VMS	QL-YNWA9-PB	$595.00
DEC SoftPC for ULTRIX	QL-YP7A8-PB	$725.00
DEC SoftPC for VMS Upgrade	QL-YWBA9-PB	$200.00
DEC SoftPC for ULTRIX Upgrade	QL-YWCA8-PB	$200.00
Media and Documentation	**Order Number**	**List Price**
DEC SoftPC for VMS TK50	QA-YNWAA-H5	$150.00
DEC SoftPC for VMS 16MT9	QA-YNWAA-HM	$150.00
DEC SoftPC V2.2 for VMS (Documentation Only)	QA-YNWAA-GZ	$26.00
DEC SoftPC for ULTRIX TK50	QA-YP7AA-H5	$150.00
DEC SoftPC for ULTRIX 16MT9	QA-YP7AA-HM	$150.00
DEC SoftPC V2.2 for ULTRIX RISC (Documentation Only)	QA-YP7AA-GZ	$25.00

DECquery for Macintosh

Joins Database Query Family

PC users are hungry for timely, accurate on-line business information. MIS wants to cut database query backlogs and make more efficient use of system support resources.

What's the solution for both? DECquery. DECquery provides DOS-based PC (and now Macintosh) users with fast, easy, flexible access to a wide variety of corporate databases — without programming and without calling on systems support resources.

DECquery enables users of DOS character-cell, MS-Windows, and Macintosh systems to browse through and extract information from leading corporate databases such as VAX Rdb/VMS, VSAM, ORACLE, VAX RMS, and DB2. Users can generate database queries, create reports, and extract data for use in spreadsheets, database managers, graphics packages, and other popular PC and Macintosh applications.

DECquery for Macintosh runs on any Macintosh system that has a minimum of 2 Mbytes of RAM, at least 1 Mbyte of free disk space, a 3.5-inch floppy drive, and that uses System 6.0.4 or later. It requires PATHWORKS client software V1.0 or later. Any VAX system that supports VMS V5.3 or later can act as a server system.

DECquery for DOS runs on any IBM-compatible PC with a hard disk and at least 640K memory and requires PATHWORKS client software V3.0. DECquery for MS-Windows runs on a 286-based or higher IBM-compatible PC configured for Microsoft Windows V3.0 MS-DOS, and requires PATHWORKS client software V4.0. The server system for either can be any VAX system that supports VMS V5.4 or later.

Ordering Information

Single-user licenses for DECquery for Macintosh, DECquery for DOS, and DECquery for MS-Windows are each priced at $160. Media and documentation for each are $40.

DECquery for Macintosh
Order # QL-GGCAW-AA

DECquery for DOS
Order # QL-GGBAW-PB

DECquery for MS-Windows
Order # QA-GGDAA-HW

For technical presales assistance, call 800-343-4040. To order, call 800-DIGITAL (800-344-4825).

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NETWORK SHORTS

IBM widens distribution

IBM announced it has expanded its connectivity products distribution channel to IBM Authorized Distributors-Connectivity Products, a new reseller designation. These distributors will reportedly identify and approve resellers to add value and remarket IBM Token Ring and Personal Computer Network hardware and software to end users. The current participating distributors are Gates/FA in Greenville, S.C.; Ingram Micro in Santa Ana, Calif.; Management Systems Group in Hauppauge, N.Y.; Tech Data in Clearwater, Fla.; and Vitek in Carlsbad, Calif.

Hewlett-Packard Co.'s OTS/9000 transport-layer service has reportedly passed the U.S. Government Open Systems Interconnect Profile (GOSIP) conformance tests. GOSIP compliance is required for all federal agency procurements to ultimately allow information flow among dissimilar computers.

A $1 million contract between supercomputer maker **Convex Computer Corp.** and X terminal vendor **Tektronix, Inc.** has Convex reselling Tektronix's $6,795, 19-in. XP29 color terminals to its scientific, engineering and technical users.

Sprint takes on desktop videoconferencing

BY ELLIS BOOKER
CW STAFF

KANSAS CITY, Mo. — Already a leading provider of videoconferencing services through its worldwide network of more than 1,000 rentable videoconferencing rooms, U.S. Sprint Communications Co. now wants to be at the forefront of desktop-to-desktop videoconferencing.

For about a year, the long-distance company has been piloting a prototype system of its own design at its headquarters here.

The experimental system, which uses Apple Computer, Inc. Macintosh IICX and IICI workstations, is used by a dozen executives who can "go to the video" with each other and connect to videoconferences on The Meeting Channel, Sprint's commercial videoconferencing network.

Sprint officials conducting the trial are intensely hush-hush about both their marketing plans for the technology and about how the Sprint long-distance network may be used to carry the video traffic.

They are not, however, shy about trumpeting their approach, which they claim to be the least costly available today.

"The difference in our approach is that we centralized a lot of costly equipment," explained Dave Baker, Sprint's process consultant.

Sprint was able to do away with the costly video coder/decoder (codec) at each workstation in favor of a centralized processor, essentially creating a video private branch exchange.

A basic hub with a switch and a couple of codecs would cost $50,000 to $60,000, Baker said. The incremental cost of adding users to the network — provided they already have workstations — would be about $2,000, including $1,000 for the video board, $800 or $900 for the camera and a few hundred dollars for the wiring, he said.

The analog video signal runs over dedicated coaxial cable inside individual buildings and is converted to digital signals by the codecs at the hub for transmission between remote offices. Control of call setup is handled over the standard local-area network that connects the workstations. The future product will also be able to send video over a LAN directly, Baker confirmed.

"We did the trial internally to understand the issues related to desktop videoconferencing," said Larry Lake, vice president of enabling technology.

However, Lake said, Sprint will not extend the videoconferencing setup to more of the approximately 2,000 Macintosh users in Sprint's headquarters — not, at least, until they can become alpha testers for the commercial product.

Apple's Systems Integration Group was a co-developer on the Sprint pilot, but there are no plans to "productize" that system, according to Apple sources.

Breaking the barrier

Late last month, Peabody, Mass.-based Picturetel Corp., a leading provider of videoconferencing gear, broke the $20,000 price barrier.

The two low-cost models of its System 4000 line are targeted at small and medium-size companies, Picturetel said. The monochrome Model 20 Administrator System is priced at $19,900; a color Model 100 Professional System costs $24,900. The color system is the lowest cost available in the world today, according to Picturetel.

Both systems, which are slated to be available in the third quarter, use 20-in. monitors, are interoperable with all Picturetel videoconferencing systems and support data rates from 56K bit/sec. to 128K bit/sec.

Systems integrator fills network design niche

BY GARY H. ANTHES
CW STAFF

FAIRFAX, Va. — A vortex of forces is confronting and often bewildering users and managers of corporate networks, leaving many of them searching for expertise they cannot find among their staff members.

The need for networking expertise has opened up a market niche for specialized systems integration, and 5-year-old Network Management, Inc. (NMI) has moved to fill it. Recent top management changes mark its transition from a small start-up to a mature firm with more than half of the Fortune 500 companies as customers.

Francis A. Dramis Jr. is NMI's new chairman, president and chief executive; he replaced Chairman, co-founder and entrepreneur Howard Frank last month. According to Dramis, the company has capitalized on three advances in technology that are profoundly affecting the way users compute and communicate: increases in workstation power, advances in network technology and the advent of relational networked databases.

NMI, with $52 million in revenue last year, has pursued its vision of becoming a soup-to-nuts network systems integrator from the beginning, stitching together, through six acquisitions in four years, the pieces it says are needed to set itself apart from the mainstream systems integrators. Those acquisitions brought the company expertise in areas such as network design and facilities management.

Dramis, *NMI's new leader, is capitalizing on advances in technology*

"Any company can call itself a systems integrator, but you have to have a lot of value added," said Charles Robbins, a communications analyst at Boston-based

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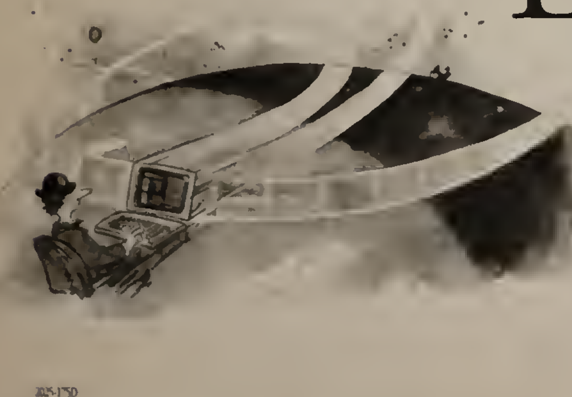

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2025-175D

Beyond Mail software steps beyond competition

BY JIM NASH
CW STAFF

CAMBRIDGE, Mass. — Work begun in the mid-1980s aimed at automating the collection and distribution of information on networks recently came to fruition with the official shipment of Beyond Mail. Response from users of beta-test versions of the product was almost unanimously favorable.

Although ostensibly an electronic mail application, Beyond, Inc.'s product integrates a rules-based programming language — Beyond Rules — that allows end users of E-mail to roll their own messaging applications.

That separates Beyond Mail from its E-mail competitors, said analyst Esther Dyson, principal at Edventure Holdings, Inc. in New York.

Consultant Walter Ulrich at Arthur D. Little, Inc. in Los Angeles called Beyond Mail a milestone. Ulrich said no commercially available E-mail package has the same rules-based technology and filtering capabilities.

Simple transformation

Early users of Beyond Mail applauded the firm for transforming E-mail from a simple transporter of messages to a base on which to run other applications. Beyond Mail began shipping earlier this month

Based on Information Lens, an expert information system project begun in the mid-1980s at MIT, Beyond Mail automatically filters incoming information, compiles and distributes reports and performs a host of other tasks, all of which can be created or customized by E-mail users.

Greg Byfield, director of finance and information systems at the Massachusetts Corporation for Educational Telecommunications, also in Cambridge, said Beyond Mail saves him an hour of work each day.

Byfield said he was able to program the software to put all mail containing keywords into an urgent file.

"I get 80, 90, 100 messages a day," Byfield said. Instead of wading through each to find important messages concerning finances or budgets, he explained, he instructed Beyond Mail to snare messages with those two words.

Programs also can be written to compile report information from individual employee databases into periodic departmental reports. But some end users said they are pleased with less grandiose features.

"I like the programmability," said Fred Moore, assistant director of environmental affairs at Union Carbide Chemicals and Plastics, Inc. "I get confirmation that someone hasn't looked at his E-mail." Other packages will confirm all those actually opening a message, "but I don't want 50 messages telling me who's looked at the mail."

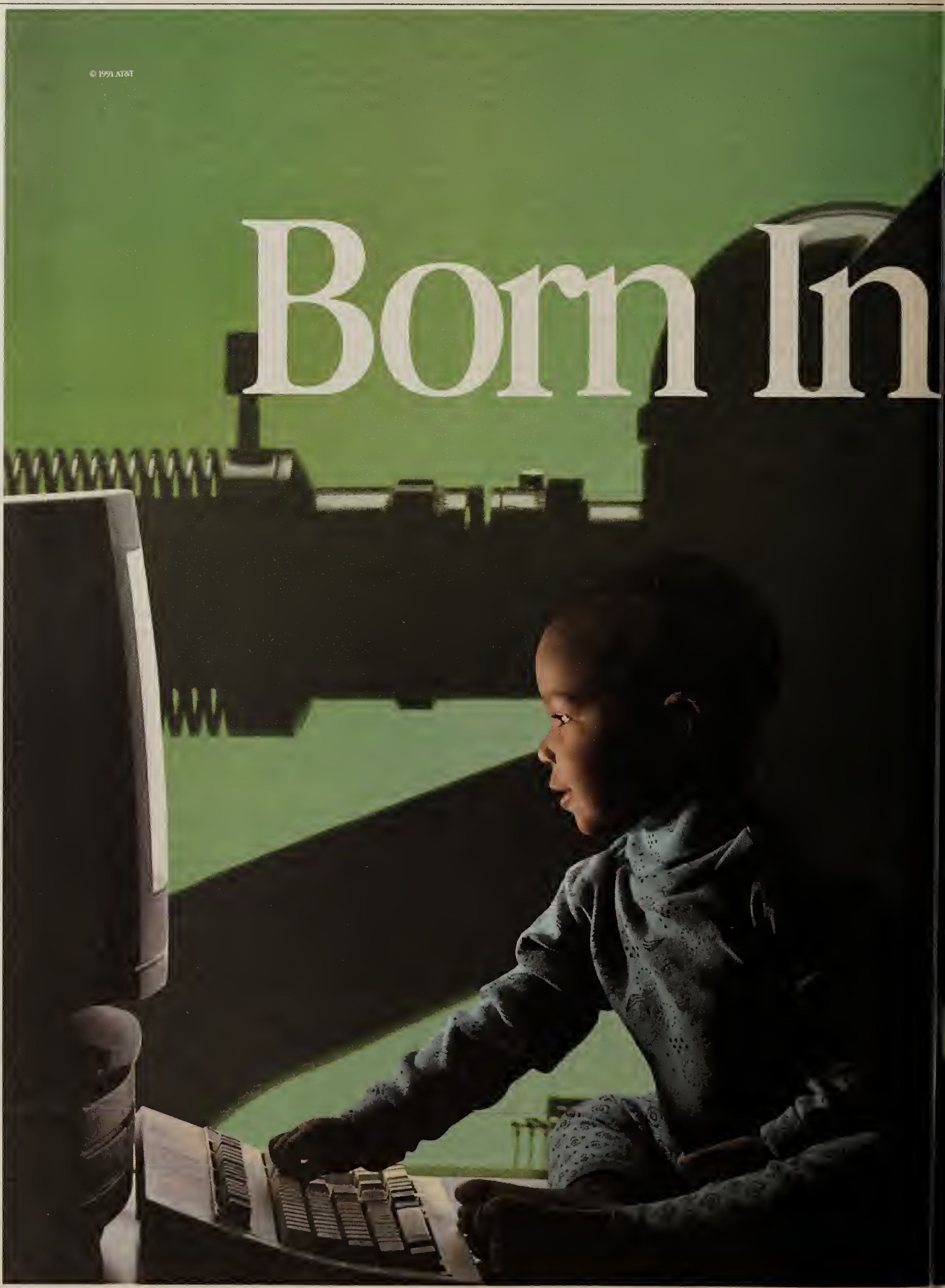
Both Byfield and Moore use Beyond Mail with Novell, Inc. networks, but the Message Handling System-based application can run on Microsoft Corp.'s LAN Manager, IBM's PC LAN, Banyan Systems, Inc.'s Virtual Networking Software and 3Com Corp.'s 3+Share.

According to Moore, the limited beta test at Union Carbide's Danbury, Conn., headquarters has seamlessly integrated Beyond Mail with the company's installed Da Vinci Systems Corp. Email for Windows software.

Chuck Digate, president of Beyond Mail, said earlier criticism that the software was focused almost exclusively on clients or personal computers has been answered.

Digate said initial test copies of Beyond Mail required a PC to be running to process messages, posing a security risk to companies. It can now be run interchangeably on servers and clients.

Beyond mail is sold in three packages: a server version with five users ($695), a five-user expansion ($395) and a 20-user expansion ($1,395).



Cardinals score with glitch fix

BY JOANIE M. WEXLER
CW STAFF

TEMPE, Ariz. — The Phoenix Cardinals saw the final technical resolution of a nearly yearlong struggle with the team's Integrated Services Digital Network (ISDN) early this month.

Charles Reckenberg, director of data processing for the National Football League team, explained that the incompatibility between US West's analog-based 911 emergency service and digital ISDN service was rectified Aug. 5. Prior to the fix, when the Cardinals dialed the 911 emergency service number, ISDN did not pass the proper phone number to the service, he explained. As a result, erroneous locations were being dispatched to cruisers, a potential safety and health hazard.

"I believe that 911 is an analog-based service that was never designed to work with ISDN. ISDN was probably envisioned to complement companies that also had analog lines," Reckenberg said.

The 911 fix came two months after US West ironed out a software glitch that plugged up voice traffic for 10 months and blocked 19 of the Cardinals' 23 64K bit/sec. channels included in Primary Rate Interface ISDN service, Reckenberg said.

He added that the five-year contract he signed last September for a Primary Rate ISDN line turned out to be 28% more expensive than he had anticipated because he did not understand that the bottom-line price he signed off on "didn't include tariffs and taxes." However, he said, he is bound to the contract and is currently "mending relations with US West."

The Cardinals selected ISDN as its complete telephone service — for voice applications only — when it moved to its new facilities here. Reckenberg said he anticipates eventually using the service to exchange videos of football games with other teams electronically instead of by overnight courier.

The Cardinals contracted with US West for a Northern Telecom, Inc. Meridian 1 ISDN-capable private branch exchange, ISDN adapter cards and fixed-cost Primary Rate service. Because the team bought the service and equipment bundled, "I don't know whose system the glitches were in, and I really don't care. I'm just a customer who wants it to work," Reckenberg said.

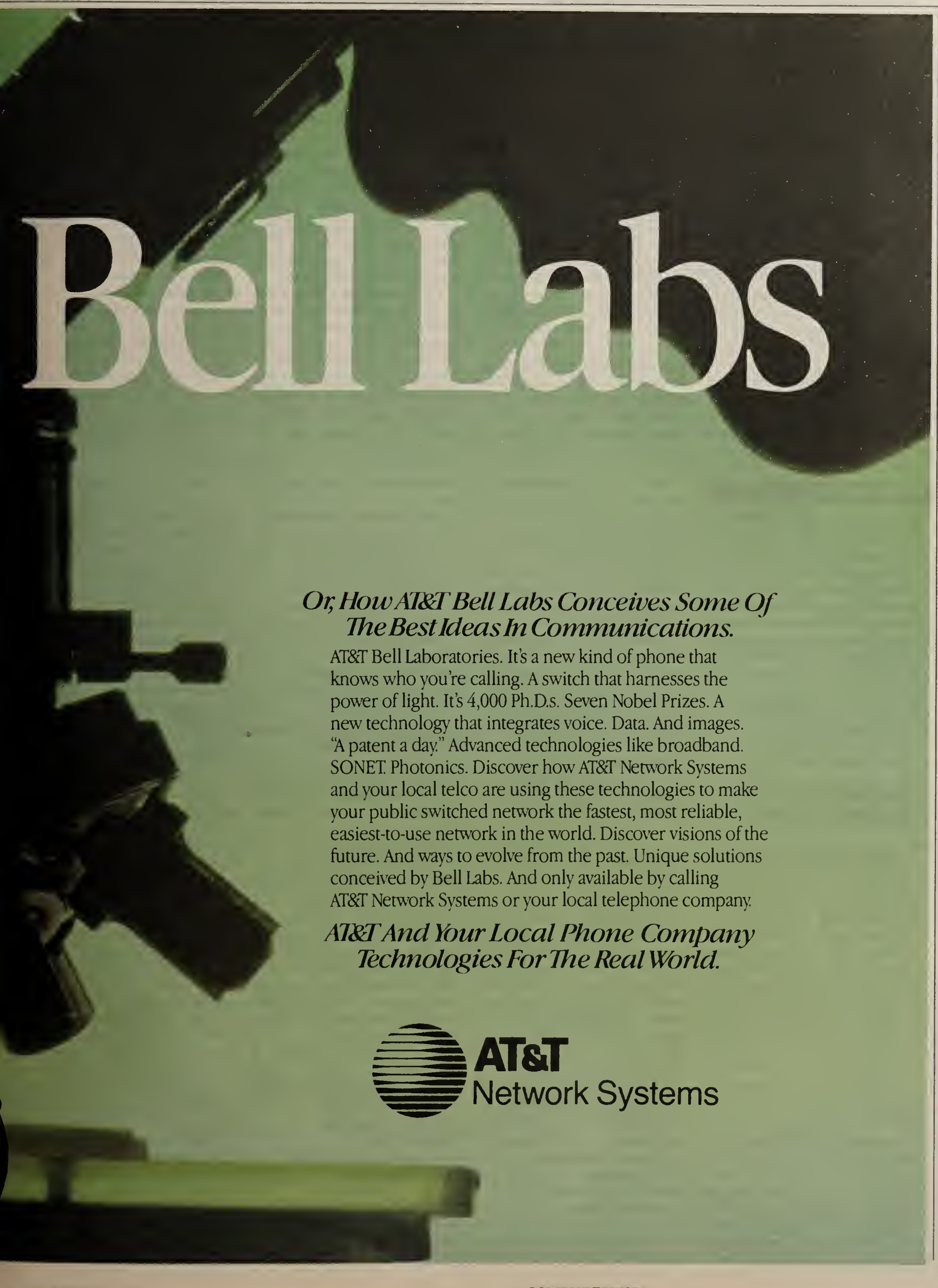
> "I DON'T KNOW whose system the glitches were in, and I really don't care. I'm just a customer who wants [his ISDN service and equipment] to work."
>
> CHARLES RECKENBERG
> PHOENIX CARDINALS

He said the ISDN selling points were "hardware costs and fixed monthly charges" over the five-year contract life. He added that programming flexibility was another plus because "with ISDN, you can have direct inward-dial trunks intermixed with main exchange trunks."

Reckenberg said he would like to use ISDN's automatic number identification (ANI) feature, which displays the calling party's telephone number and other information as a call is received, but "for potential legal reasons, US West has not been given approval to offer ANI."

The legality of caller identification services is under review; such services have already been deemed illegal in Pennsylvania.

According to Brian Moir, legal counsel for the International Communications Association, Congress is currently reviewing whether the privacy aspects associated with caller identification should render it a federal issue.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Niche

FROM PAGE 39

Aberdeen Group. "NMI is one of the more successful companies in networking systems integration. And beyond the Fortune 100, you won't find that expertise [in-house]."

As recent past managing director and chief information officer at Salomon Brothers, Inc., Dramis has seen the interplay of users and technology firsthand. "The biggest problem I see out there is users trying to come to grips with the technology revolution," Dramis said. "They have invested lots of money in a centralized base of computing, and that's served them well.

"Now, with database technology sharing data across networks, customers are having to come to grips with an explosion of corporate data being distributed — not necessarily in a planned way — around all the [local-area networks] and user departments."

One of NMI's clients is the U.S. arm of the Westdeutsche Landesbank, which is overhauling its LANs. Susan Martin, the firm's information services vice president, said she chose NMI because it was the only one of four bidders willing to work with the bank to evaluate different networking approaches.

"NMI gave us alternatives, with pros and cons, on the first day. We were impressed with their knowledge," Martin said. NMI designed and installed three bridged Token Ring LANs, but its work did not end there, Martin said. NMI now tests new software releases before they get to the bank, and, if not satisfied with the results, it works with the vendor until bugs are eliminated. She said most other vendors would not perform that function, and the bank could not afford to do it in-house.

"My biggest challenge is knowing what to buy when," Martin said. "You want to be state of the art, you want to give your end users whatever they need to compete in the marketplace, but you don't want to put something in that's going to cause problems. We look to [NMI] very heavily for advice there."

Through acquisitions, hires and product development, NMI has established credibility in a broad range of networking areas, according to analysts. "NMI competitors like [the hardware vendors] and the [mainstream systems integrators] have skills in those areas, but NMI dedicates most of its resources toward delivering network integration services," said Todd Dagres, director of communications research and consulting at The Yankee Group in Boston. "That's their knitting."

According to Dramis, NMI will take its network offerings a major step further by developing automated aids for network management. "Network control software is not robust enough yet to replace people," Dramis said. "Dark data centers exist, but not dark networks. We'll develop software to augment systems administrators' efforts."

Dramis said the software will go beyond the traditional definition of network control. He described it as "an operating system for distributed computing environments," and he said the software will have to be smart enough to understand different applications on the network.

Counterculture

When Francis Dramis joined NMI in April, leaving his post as managing director and chief information officer at Salomon Brothers, he brought with him more than an appreciation for the role of technology in complex organizations. He claimed to be a student of "work cultures," and he said his most important goal for NMI is to build a collaborative culture that blends the virtues of individual achievement with group support.

For example, he is setting up "vertical issue teams," where decisions are made not by top management alone but by groups of mixed disciplines and organizational levels. Dramis has also established weekly meetings where top managers state their activities. Those are recorded, put in a voice mail system and made available for all employees to dial into.

"This philosophy parallels technology. Open, collaborative [computing] environments need open, collaborative people," Dramis said.

NEW DEALS

Evernet lends hand

A Kraft General Foods, Inc. division, $6 billion **General Foods, U.S.A.**, has contracted with network systems integrator **Evernet Systems, Inc.** in Los Angeles for support of its existing local- and wide-area networks. Evernet reportedly will also design and install new and expanding networks for General Foods.

Evangelical Health Services, a hospital group in Chicago, recently elected to install a fast-packet and frame-relay backbone network based on **Stratacom, Inc.** switches. The network is part of a project to implement a companywide network architecture to connect departmental systems across the firm's 39 buildings.

NEW PRODUCTS

Network management

Network Application Technology has released an update of its NMS/100 network management system.

Version 1.09 includes Simple Network Management Protocol support for the company's Ethernet segment monitors and bridges. It allows management of up to 150 devices from a single workstation. The product also offers increased security features such as device passwords for forced set operations.

The NMS/100, including a fully configured personal computer base system with management software, costs $4,995. A version including software and Ethernet adapter only costs $2,995.

Network Application Technology
6186 Dell Ave.
Campbell, Calif. 95008
(408) 370-4300

Electronic data interchange

The Chase Manhattan Corp. has announced Info*Xchange, a line of electronic data interchange (EDI) products and services for cash management customers.

With Info*Xchange, the company said, it provides customer institutions with a single, integrated source for financial and nonfinancial EDI products. Info*Xchange offers connections to domestic and international value-added public networks, documentation distribution services, multiprotocol communication with Chase Manhattan and the ability to receive EDI remittance information through fax and electronic mail services.

Pricing is available from the company.

Chase Manhattan Bank
195 Broadway
New York, N.Y. 10007
(212) 669-6116

Gateways, bridges, routers

Andrew Corp. has announced the Netlynx/5400E gateway for communications between Digital Equipment Corp. Decnet users and IBM midrange systems.

The product connects users running DEC's Local Area Transport protocol on Ethernet networks to IBM systems, which treat Netlynx users as locally attached display and print devices, according to the company. Each gateway provides up to seven host sessions.

The gateway costs $5,995.

Andrew Corp.
2771 Plaza Del Amo
Torrance, Calif. 90503
(213) 320-7126

Fibermux Corp. has introduced a network topology using the Magnum100 fiber-optic backbone to connect distributed Ethernet local-area networks.

The 100M bit/sec. Magnum100 cabling, in conjuction with a slide-in Ethernet module, the CC8875Z, offers connectivity for up to 128 LANs at the native Ethernet data transfer rate of 10M bit/sec. The backbone transmits 16 different data, voice and video signals.

Pricing for the distributed bridge module starts at $3,950 per node. The price of the Magnum100 chassis with a multiplexer for fiber-optic connection ranges from approximately $4,000 to $7,000.

Fibermux
9310 Topanga Canyon
Chatsworth, Calif. 91311
(818) 709-6000

Computer Knowledge Corp. has introduced an asynchronous communications server, the Multiuser II-ACS.

The product includes both hardware and software and supports up to 100 concurrent users at 19.2K bit/sec. data speed. Users can dial out of the network without tying up their own computers, according to the company. The Multiuser II-ACS is nondedicated and can be used as a standard file server.

Pricing for a 16-user version ranges from $23,500 to $30,750, depending on memory requirements and color options.

Computer Knowledge
39 W. 14th St.
New York, N.Y. 10011
(212) 727-2880

Proteon, Inc. has announced frame-relay support on the CNX 500 and P4100+ bridging routers.

The company's implementation of frame relay includes support for all major protocols, network congestion control and enhanced security features.

Frame-relay forwarders are available at $750 for the CNX 500 and $500 for the P4100+.

Proteon
Two Technology Drive
Westboro, Mass. 01581
(508) 898-2800

Micro-to-host

Channel Computing, Inc. recently announced shipment Version 2.0 of Forest and Trees for Windows.

Forest and Trees is a data access and reporting tool that serves as a front end to spreadsheets, databases, SQL products and ASCII files. It accesses data from mainframe and midrange systems as well as personal computers. Enhancements in Version 2.0 include an improved user interface, simplified data viewing procedures and added data source support.

The product costs $495. A client/server edition costs $1,495, and network node packs cost $395.

Channel Computing
53 Main St.
Newmarket, N.H. 03857
(603) 659-2832

Robbins-Gioia, Inc. has unveiled Meow, a terminal emulator software package for personal computers.

The product includes the following: multiple Transmission Control Protocol/Internet Protocol session capability with support for File Transfer Protocol and remote copy program; Kermit, Xmodem and Ymodem file-transfer support; VT100 and VT220 terminal emulation and keyboard mapping.

Meow costs $395; an introductory price of $295 is offered through September.

Robbins-Gioia
209 Madison St.
Alexandria, Va. 22314
(703) 739-7360

Maxpeed Corp. has added support for The Santa Cruz Operation's (SCO) Unix operating system to its Maxstation graphics workstations.

The Maxstation allows multiple users to access graphics applications on a host system. With four SH-4 Multiport Controller Cards, up to 16 Maxstation users can be linked by RJ-45 telephone cable to a host personal computer system running SCO Unix.

The Maxstation offers a 16-MHz screen refresh rate with up to 720- by 348-pixel resolution and includes an I/O buffer to decrease drain on host system resources, according to the company.

The base unit costs $199. The SH-4 Multiport Controller Card for installation in the host system costs $795.

Maxpeed
1120 Chess Drive
Foster City, Calif. 94404
(415) 345-5447

MANAGER'S JOURNAL

EXECUTIVE TRACK

Richard LeFave has been named chief information officer at **The Boston Co.**, a Boston-based financial services subsidiary of Shearson Lehman Brothers, Inc.

LeFave, 39, is responsible for overseeing the firm's systems and operations group. He was also named chairman of a new technology steering committee to set policy and direction for technology initiatives. He reports to George W. Carmany III, senior executive vice president.

LeFave joined The Boston Co. in 1988 as a senior vice president of managing data processing services and operations. He previously held systems and operations positions at Baybanks, Inc.'s Data Systems Division, Nixdorf Computer Corp. and The Boeing Co.

He holds a bachelor's degree from Boston University, an MBA from the University of Puget Sound in Seattle and a master's degree in systems management from the University of Southern California.

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Dennis Sirosky has been promoted to associate vice president of information systems at **Health Alliance Plan** in Detroit.

Sirosky joined the firm in 1986 as director of IS. He is responsible for all IS, data communications and technical computing.

He holds a bachelor's degree in psychology from the University of Michigan and an MBA from Wayne State University in Detroit.

……

Jeffrey Fischer has been named senior vice president in Service Products Administration at **LaSalle National Bank** in Chicago.

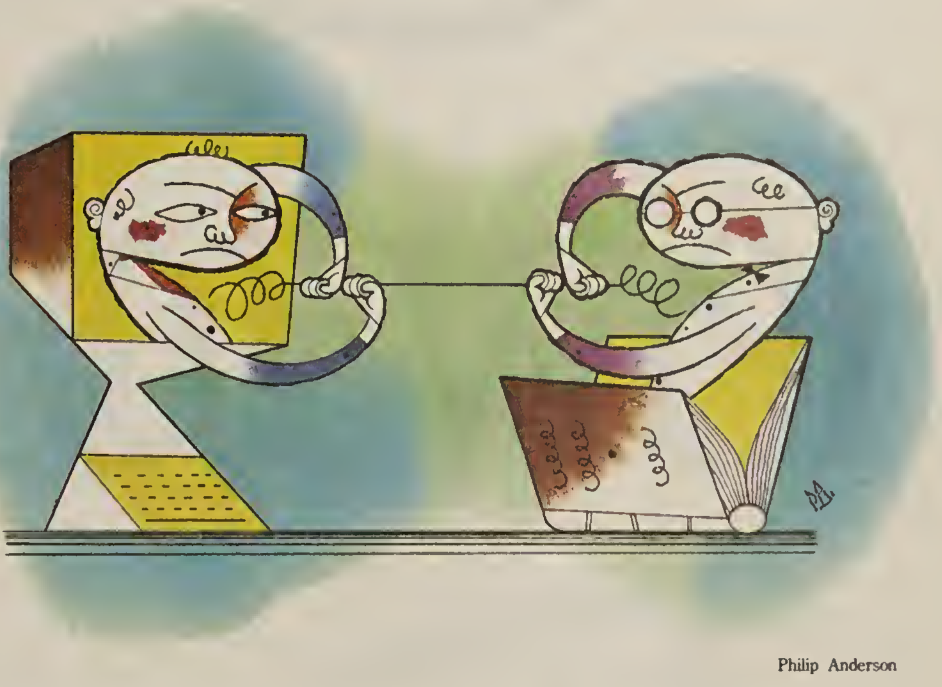
Fischer is responsible for wire transfer, balance reporting, automated clearing-house and account reconcilement processing functions.

Before joining LaSalle, Fischer was an electronic banking consultant. Previously, he was president of Byad, Inc., a software firm.

A rift in the information ranks

Corporate librarians seek more respect from the IS department

BY SHERYL KAY
SPECIAL TO CW



Philip Anderson

Few would disagree that information is a critical strategic weapon in today's business world. Yet in many large organizations, the traditional information storehouse of the corporate library is not integrated with and, in some cases, is downright at odds with, the information systems department.

The problem begins high up on the corporate ladder, says Larry Prusak, senior manager at Ernst & Young's Center for Information and Strategy in Boston. Libraries in their current state are underutilized by corporate executives and are generally viewed as a "fetch-and-retrieve" department. This low-status message is communicated to IS, which, in turn, places library systems way down on the priority list.

Charles Heller, president of New York-based recruiting firm Heller and Associates, has heard this very complaint from the librarians that he places. "MIS tells them that they are just regurgitating information and looks down at corporate librarians as if they were just clericals," Heller says.

Adding fuel to the fire is a communications problem. "Most librarians speak librarianese," Heller says, "while the IS department speaks computerese. It's the old 'words vs. numbers problem.' "

Cultural differences create big barriers to a good working relationship, according to one Fortune 500 pharmaceutical firm's corporate librarian, who requested anonymity. IS "works differently than we do," he says. "There are a lot more bureaucratic layers to get things done, and we aren't used to that. Also, they have a much broader client base, which makes them much tighter with the resources they have available. So on the few occasions that we may have to go to them, they don't respond to us very well or very quickly."

Basic differences

Ellen Sleeter, IS librarian at the law firm Davis Polk & Wardwell in New York, finds that library systems are considerably different from other applications and suggests that is the reason is why IS departments shy away from becoming involved with such systems.

"All library applications depend on variable-length text fields," Sleeter notes, "and the database model is not commonly understood by your typical accounting systems professional." Bibliographic information to be transferred between computers, for example, must adhere to a standard — U.S. Machine Readable Catalog — that is unique to library and text systems.

Today's corporate librarian must possess some solid technical skills in order to be taken seriously by IS, as well as to be successful in the automated information center. At Bankers Trust Co., where the libraries and IS boast a strong working relationship, the library staff must be able to download files, save them, place them into the electronic mail system and then send the files out to the proper location.

"They all have hands-on experience with accessing electronic data, using the PC as an intelligent tool," says Ron Schnitzer, vice president of technology for Global Corporate Finance at Bankers Trust.

Many librarians do fall short in this area, however, compounding the frus-

Continued on page 46

More IS spending? Not this year

BY CLINTON WILDER
CW STAFF

One year ago, Iraq had just invaded Kuwait and IS budget planners were being asked to hold the line on their 1991 spending plans because of economic uncertainty.

One year, one Gulf war and one recession later, information systems budget planners are being asked to hold the line on their 1992 spending plans because of the same reason.

"They really can't spend much when their companies are looking at prospectively flat growth through the first and second quarters of next year," said Robert L. Bush, president of management consulting firm Robert L. Bush & Associates, Inc. in Morristown, N.J.

Bush, a veteran management consultant, has done an early budget season IS spending forecast for the past several years.

The forecast is based on economic data models and interviews with 20 client companies whose IS budgets are $10 million or more. Industries represented include airlines, banks, direct marketing firms, insurance companies, financial services firms and manufacturers.

Bush predicted IS budget increases will, at best, just keep up with inflation. "You will see 5% salary increases and that sort of thing," he said. "But I don't see the economy coming out of this recession with a roar. There is no way that the funding for rapid increase in IS budgets is going to be there."

In the past year, companies learned a lot about doing more with less, and the trends that stem from a highly cost-conscious mentality will continue. Mainframe buying and upgrading will continue to decline, and more applications will move to smaller platforms. "I see the leaders in the field exploring ways to get things off the mainframe," Bush said.

Quick results wanted

Not surprisingly, senior management will continue to press for quantifiable IS benefits. "Executives are taking a much harder look at projects that don't have a quick market payoff," Bush said.

Will any technologies emerge as winners from these economic doldrums? Among his client base, Bush said, he sees a great upsurge in interest in the Unix environment for mainstream commercial applications.

"It's partly from data and partly from gut feeling, but it seems to be a real growth area," he said. "It's a much, much stronger environment than it was a couple of years ago."

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Rift

FROM PAGE 43

tration felt by their IS departments. Even worse can be their level of business savvy. As most computer departments have shifted their emphasis from technical to business awareness, working with librarians who are not trained in economics, marketing and other related topics can seem to be a futile endeavor.

Jim Matarazzo, a professor at the Graduate School of Library and Information Sciences at Simmons College in Boston, says that it is not enough for today's corporate librarian to be technically competent. "Librarians must take the next leap, just as IS had to a few years back, and become part of the fabric of the business — part of the corporate culture," he observes.

Model behavior

Bankers Trust is a good model for a well-integrated library, which the bank actually calls its information center. Under the direct auspices of Vice President of Global Finance Carol Ginsburg, the information center has grown from one dumb terminal in 1982 to more than a dozen personal computers using a Token Ring local-area network to access a variety of library-specific systems. And the respect between Schnitzer and Ginsburg (who is a former librarian) has grown congruently.

"There is nothing that Carol and her people can't get their hands on," Schnitzer says. Bankers Trust executives may ask for industry-specific searches, information on individuals who sit on different corporate boards or other external data. The center is open six days a week, and Schnitzer says that it has grown into the de facto corporate library for the entire bank, not just global finance.

Sometimes the distinction between IS and the library can become blurred, particularly in academic institutions. Several universities have promoted their head librarian to preside over all computing as well as the library. Such is the case at Rutgers University in New Brunswick, N.J., where Joanne R. Euster was named vice president for information services and university librarian last year.

Coming from a pure library management background, Euster is responsible for all academic and administrative computing at Rutgers. This resulted from the convergence of many functions of the library and computing services, as well as the developing interrelationships among print information, electronic data resources and telecommunications, says Edward J. Bloustein, Rutgers president. This scenario may well be on its way to the corporate world.

Whether that happens or not, IS professionals must be aware that the corporate library is here to stay and is increasing in its importance to top business executives. With or without IS, corporate libraries will deliver.

"There are an awful lot of turnkey library systems," Ginsburg says, "and if you can't get it through the front door, you'll just go to the back door."

Another model of the best IS/library relationship may be found on the other side of the Pacific. Ernst & Young's Prusak recently visited 10 of Japan's largest companies to observe how they managed their information.

"In all of my years at this, I saw something in Japan that I have never seen in America before," he says. "Senior executives were actually using their libraries — in person. And they weren't just reading the sports page, either."

Kay is a Tampa, Fla.-based business consultant and free-lance journalist specializing in human resources and emerging technologies.

A Foote in the door

At the advertising firm Foote, Cone & Belding in Chicago, applications are developed and maintained by the library personnel — and IS wants it that way.

"I know modems, hardware, level of computing power and connectivity," says Creag Banta, vice president of integrated systems, "but our library's expertise is so highly skewed away from my group's that it would be highly presumptuous of me to think that I should take over library systems."

Banta adds that the only time there is discord between the departments is when the library's systems are down, but such a scenario may only happen two or three times a year. "Since they are usually working under very tight deadlines, I can understand why they want those systems up and running as soon as possible," he says.

If a company is unable to fund a full-time, dedicated systems effort for its library, as Foote, Cone & Belding has done, a firm may want to retain an independent library automation consultant. Ellen Sleeter, IS librarian for the law firm Davis Polk & Wardwell in New York, says a consultant can help alleviate any friction that could occur between IS and the library, while at the same time bringing the library into its critical role as gatekeeper of the automated, external information repository.

Once the initial analysis, design and development is completed, the consultant can be discharged, leaving IS and the library to collaborate on the maintenance effort. Firms that provide library consulting services include KPMG Peat Marwick, Price Waterhouse and Robert McGee Associates in Chicago.

SHERYL KAY

CALENDAR

CAM-I will hold its 1991 Executive Forum entitled "The Integrated Enterprise: Moving Beyond Technology" at the Grosvenor Resort in Orlando, Fla., Sept. 23-25.

Featured speakers include Hal Sperlich, former president of Chrysler Corp., and Steven Wheelwright, an author and a professor at Harvard Business School. The conference will include the presentation of findings from CAM-I's Computer Integrated Enterprise Program, a joint research program.

For more information or to register, contact Nancy Thomas at CAM-I conference services, Arlington, Texas (817) 860-1654.

SEPT. 8-14

Development Center Institute Conference. San Diego, Sept. 8-11 — Contact: Development Center Institute, Inc., Indianapolis, Ind. (317) 846-2753.

Telecon '91. Edmonton, Alberta, Sept. 8-12 — Contact: Canadian Business Telecommunications Alliance, Toronto, Ontario (416) 865-9993.

Software Development Week. Boston, Sept. 8-13 — Contact: Lisa Monson, Software Development Conference & Show Group, San Francisco, Calif. (415) 905-2414.

Navy Micro '91. Virginia Beach, Va., Sept. 9-12 — Contact: Navy Micro '91, Norfolk, Va. (804) 444-8487.

Data Storage Interface & Technology Conference IX. Sunnyvale, Calif., Sept. 9-13 — Contact: Technology Forums, Minnetonka, Minn. (612) 934-1415.

Wireless & Mobile Communications III. Washington, D.C., Sept. 10-11 — Contact: Telecommunications Reports, Washington, D.C. (202) 842-0520.

Data Storage. San Jose, Calif., Sept. 10-12 — Contact: Forum Management, Cartlidge and Associates, San Jose, Calif. (408) 554-6644.

Downsizing Expo. Los Angeles, Sept. 10-12 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Government Neural Network Applications Workshop. Huntsville, Ala., Sept. 10-12 — Contact: Rene Kirkwood, U.S. Army Research Office, Research Triangle Park, N.C. (919) 549-0641.

Information Highways: Linking America for Interactive Communications. New York, Sept. 11-12 — Contact: Business Week Executive Programs, New York, N.Y. (212) 512-2184.

Multivendor and Third Party Computer Maintenance. San Francisco, Sept. 11-12 — Contact: Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Aion User Conference. Monterey, Calif., Sept. 11-13 — Contact: Aion Corp., Palo Alto, Calif. (415) 328-9595.

ABCD: The Microcomputer Industry Association's Breakaway '91 Conference. Atlantic City, Sept. 11-13 — Contact: Deborah Keating, ABCD, Ridgeland, Miss. (601) 977-9033.

Software Publishers Association (SPA) Seventh Annual Conference. Orlando, Fla., Sept. 11-14 — Contact: SPA, Washington, D.C. (202) 452-1600.

SEPT. 15-21

International Electronics Packaging Society (IEPS) Conference. San Diego, Sept. 15-18 — Contact: William Ashman, IEPS, Wheaton, Ill. (708) 260-1044.

Data Administration Management Association International Symposium. Seattle, Sept. 16-17 — Contact: Bill Harenburg, Triadigm International, Los Angeles, Calif. (213) 622-0123.

Effective Methods for Information Systems Quality Assurance. Orlando, Fla., Sept. 16-18 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Federal Computer Conference. Washington, D.C., Sept. 17-19 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Auto-Tech '91. Detroit, Sept. 17-19 — Contact: Automotive Industry Action Group, Southfield, Mich. (313) 358-3570.

CASE Conference: Rebuilding for Software Automation with the 4 Rs of CASE. San Francisco, Sept. 17-19 — Contact: Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Call Management for the Help Desk. Woodfield, Ill., Sept. 17-20 — Contact: Help Desk Institute, Colorado Springs, Colo. (719) 531-5138.

Strategic Planning for Information and Systems. Houston, Sept. 18-20 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Network and Distributed Systems Management '91. Washington, D.C., Sept. 18-20 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Working with Personal Computer Local Area Networks. Milwaukee, Sept. 18-20 — Contact: John T. Snedeker, University of Wisconsin at Milwaukee, Milwaukee, Wis. (414) 227-3120.

Acucobol Developers Conference. San Diego, Sept. 19-21 — Contact: Acucobol, Inc., San Diego, Calif. (619) 689-7220.

Society of Telecommunications Consultants (STC) Annual Fall Conference. San Diego, Sept. 20-23 — Contact, Sharyl Bradley-Hennard, STC, Boca Raton, Fla. (407) 852-7071.

SEPT. 22-28

A Shared Solution in Software Technology Conference. Montreux, Switzerland, Sept. 22-25 — Contact: ASSIST, Chicago, Ill. (312) 644-6610.

Information Technology and the Corporate Agenda: People, Productivity and Profit. Monterey, Calif., Sept. 22-25 — Contact: Lynda Rosenthal, CIO, Framingham, Mass. (508) 935-4631.

Softworld. Vancouver, British Columbia, Sept. 22-25 — Contact: The Computer Software and Services Industry Association, Arlington, Va. (703) 522-5055.

Advanced Network Computing Forum. Boca Raton, Fla., Sept. 23-24 — Contact: Megan Senete, New Science Associates, Inc., Southport, Conn. (203) 259-1661.

Posix Open Systems Frameworks and Profiles Seminar. Phoenix, Sept. 23-24 — Contact: Institute of Electrical and Electronics Engineers, Inc., Piscataway, N.J. (908) 562-3824.

Lights On III Symposium. San Francisco, Sept. 23-24 — Contact: Peri Hoffman, Association for Computer Operations Management, Orange, Calif. (714) 997-7966.

Strategic Systems Development Seminar. Minneapolis, Sept. 23-24 — Contact: David Sturtevant, Information Engineering Systems Corp., Alexandria, Va. (703) 739-2242.

Data Administration and Data Dictionaries. Washington, D.C., Sept 23-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Virtual Reality '91 Conference and Exhibition. San Francisco, Sept. 23-25 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

Association of Records Managers and Administrators (ARMA) 36th Annual Conference. Orlando, Fla., Sept. 23-26 — Contact: ARMA International, Prairie Village, Kan. (913) 341-3808.

Total Quality in Telecommunications. San Diego, Sept. 23-28 — Contact: Telecommunications Association, Covina, Calif. (818) 967-9411.

Showcase VI Conference. Advances in Applications Development. St. Louis, Sept. 24-25 — Contact: Washington University, St. Louis, Mo. (314) 889-5380.

Engineering Documentation Management Systems User Forum '91. Cincinnati, Sept. 24-26 — Contact: Carol McCalmont, Kalthoff Group, Cincinnati, Ohio (513) 871-7804.

Vitalink User Exchange Annual Meeting. San Francisco, Sept. 24-27 — Contact: Marilyn Callaghan, Vitalink Communications Corp., Fremont, Calif. (415) 794-1100.

Chicago Area Data Processing Management Association (DPMA) Joint Chapter Meeting. Arlington Heights, Ill., Sept. 25 — Contact: Jan LaHayne, DPMA, Chicago, Ill. (312) 222-8042.

Distribution/Computer Expo '91. Atlantic City, N.J., Sept. 25-26 — Contact: C. S. Report, Exton, Pa. (215) 827-7436.

Diskcon '91 Trade Show and Technical Conference. San Jose, Calif., Sept. 25-26 — Contact: International Disk Equipment and Materials Association, Sunnyvale, Calif. (408) 720-9352.

Operations Managers Conference. Laconia, N.H., Sept. 26-27 — Contact: Jerry Lemelin, Portsmouth, N.H. (207) 438-2815.

Excellence Through Total Quality Management. Washington, D.C., Sept. 26-27 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

BOOK REVIEWS

Listening your way to computer expertise

Audiocassette learning tapes: Computer Virus; Computer-Aided Software Engineering; Open Systems Interconnect
By Tony Fonze
Memorable Technology, $39.95 each

The concept here is a bit like *Sesame Street* for executives. Memorable Technology's audiocassettes tackle the job of keeping information-inundated managers up on the computing industry by entertaining the pupil so much, he forgets that he's learning.

Listeners come to identify with two main characters who reappear in each taped radio play: trade rag journalist Anthony Hughes and kindly scholar Professor von Fonze. The characters' discourse clears up much of the industry's tongue-twisting, mind-boggling vernacular in a refreshing way. Lots of repetition shields the listener from concentration overload.

The initial three tapes, however, lack the polish that listeners should expect in subsequent offerings as fledgling scriptwriter, producer and Memorable Technology President Tony Fonze gains experience. For example, Professor von Fonze's stereotyped Viennese accent not only becomes tiresome but often intrudes on comprehension (his "th's" authentically sound like "z's").

Also, the Open Systems Interconnect (OSI) tape kicks off with a long-winded description of the standards process — probably the most abstruse and least applicable aspect of OSI to the audience.

However, the audiocassette medium beckons to today's executive who capitalizes on pockets of free time on the highway and at airports. The tapes run an unintimidating two hours or less and are accompanied by helpful glossaries of terms and vendors associated with the subject matter at hand. On deck: New tapes covering databases and operating systems.

JOANIE M. WEXLER

Cyberpunk: Outlaws and Hackers on the Computer Frontier
By Katie Hafner and John Markoff
Simon & Schuster, Inc., $22.95

Tuck in the covers and turn on the nightlight — *Cyberpunk: Outlaws and Hackers on the Computer Frontier* will chill the blood of the bravest systems operator. Hafner and Markoff spin the tales of phone phreak Kevin Mitnick, German hacker "Pengo" and Internet worm author Robert T. Morris in absorbing detail.

Information systems professionals can find an interesting moral in these horror stories: The weak link in network security is often the human link; hackers often pry their way into innumerable systems by posing as service technicians and talking unsuspecting users out of their passwords.

Are these hackers larger than life? Are the authors playing for a cheap scare? *Cyberpunk* dwells on the success of the phone phreaks and hackers and only rarely mentions any failures, but ultimately the detailed reporting makes the book convincing. The portrait of Morris is of special interest; juxtaposed with Mitnick and Pengo, Morris appears remarkably innocent.

DEREK SLATER

The Making of Microsoft
By Daniel Ichbiah and Susan L. Knepper
Prima Publishing, $19.95

Ever wonder what transpired before the now infamous Bill Gates became the nation's youngest self-made billionaire?

Ichbiah's book, translated from the original French into English by Knepper, describes how the brilliant young student from Seattle entered Harvard University with the intention of becoming an attorney but later dropped out, against the advice of his parents, to pursue his passion: computer programming.

The book traces Gates' career from its innocent beginnings when he and his high school friends began toying with a Digital Equipment Corp. PDP-10 minicomputer through their school and flows easily to follow Gates' meteoric rise to the top of the software profession. The second half of the book concentrates on the release and success or failure of various Microsoft products.

The author interviewed many people who knew Gates in the early years of his career, and they paint a picture of a dedicated young man who was destined for success.

At times, the writing gets bogged down with explanations of terms such as "bit" and "BIOS." But there are intriguing passages to even things out — discussions of Microsoft's involvement with the development of the original IBM Personal Computer, for instance. Did you know that IBM required the Microsoft employees to keep the prototype machine in a locked room at all times, even though the heat in the windowless and unventilated room often became unbearable? Did you know that Gates played a major role in introducing microcomputing to Japan? Did you realize that Gates was also involved in the release of the first portable microcomputer?

The book reveals these not commonly known facts, and a preface to the text explains why French author Ichbiah was writing about an American company.

ALAN J. RYAN

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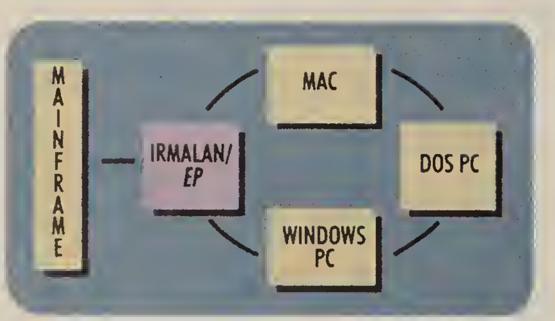

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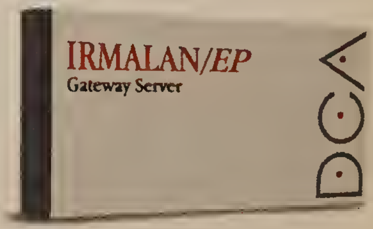

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Storage systems

Ideally, data would store itself in the most efficient way. In reality, the products don't do it all, and full automation is a long way off

BY WILLIAM CAPPELLI

The good news is that storage hardware prices fell by 60% to 70% in the 1980s, when measured on a per-1M-byte basis. The not-so-good news is that it's still expensive to manage that storage. In fact, the price difference between storage that is managed and just plain storage space has increased by a factor of five.

Not only is this trend not expected to turn around, but the cost difference is forecast to increase during the next five years for a few reasons:

- Labor costs. The growing complexity of managing storage requires personnel to have new skills and higher educational levels. These translate into higher salary and benefit levels.
- Complicating matters is the fact that with distributed processing architectures on the rise, a larger percentage of storage management is falling directly into the hands of end users. These people simply don't have the skills to be efficient with available storage.
- The spread of end-user computing and on-line systems has also laid some storage space to waste. Both demand fast data retrieval, which is often obtained through extra direct-access storage device (DASD) space containing copies of data sets residing on other storage areas. As a result, many large installations now allow as much as 50% of their storage to go unused.
- The technology itself is also to blame. Application code tends to exploit the physical configuration of the data it accesses. Hence, storage managers are sometimes unable to take advantage of new storage technologies such as optical storage.

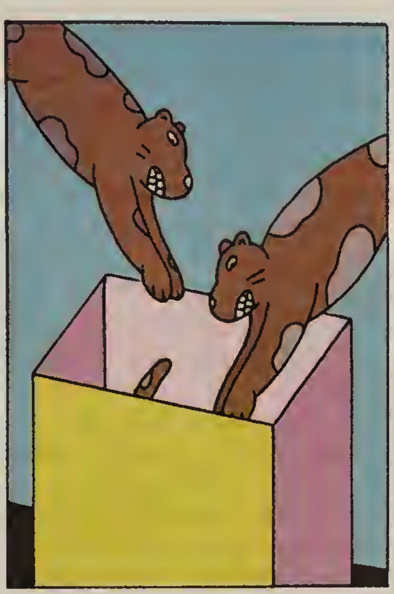
Attempted solutions

The major hardware vendors have taken a strong interest in alleviating some of these problems by providing automated storage management technologies. IBM's System Managed Storage (SMS) is best understood as an attempt to address each of the above problems.

Partial automation of storage management promises to slow spiraling labor costs. Automation algorithms are also intended to allocate data to the appropriate storage better than the operations staff, reducing the need for redundant devices.

SMS products are also intended to take a large portion of the management of distributed storage out of end users' hands. The very architecture of the products will reimpose a more centralized way of dealing with storage issues.

And lastly, by erecting a "wall of automation" between applications and the underlying storage they access, SMS will make it possible to migrate to new storage technologies with minimal recoding effort.


Stephen Turk

Although most large installations laud IBM's SMS efforts, however, many would prefer to automate their storage management practices in a piecemeal manner. This works directly in favor of independent software vendors of storage management software for IBM equipment. One problem that immediately arises with these third-party products, however, is the intimate relationship between hardware and software in this area.

In addition, because many hardware vendors are tending to migrate large portions of storage management functionality to microcode, there stands a risk that new releases of operating systems and storage hardware will render a given third-party solution obsolete.

Nevertheless, third-party vendors of IBM software do market two types of viable products: storage management products that can offer better price/performance than IBM and tools that monitor storage data rather than actually managing it.

Sterling Software, Inc., Innovation Data Processing, Inc. and Computer Associates International, Inc. sell utility-type products that compete head-on with IBM's DFDSS storage manager.

Sterling, one of the bigger players in this arena, offers Storage Automation Management System (SAMS) as an alternative to and compatible product with IBM's DFSMS. SAMS addresses areas such as space management, volume management, data compression, backup and recovery. Sterling is also at work on Project Eagle, an object-oriented version said to allow for real-time storage management.

CA offers CA-ASM2 as the storage management component of its CA '90s strategy. CA-ASM2 enables space management, data organization, automatic backup and archival of data to tape. CA is also expected to support Digital Equipment Corp.'s Network Applications Support in the future.

Innovation offers Automatic Backup and Recovery and Fast Dump Restore, a suite of products for storage management, both at the tape and DASD levels. An interesting feature of the DASD suite, Stand Alone Recovery, enables data recovery without the operating system.

All three firms were able to carve out significant market share in the early to mid-1980s, when IBM had little to offer in the storage management arena. With the advent of IBM's popular DFSMS in 1988, these same companies market their products as compatible with the SMS strategy. At the same time, Sterling and CA also position their products as SMS alternatives,

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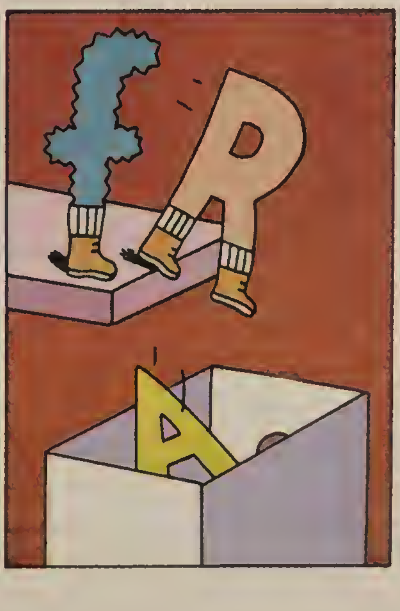

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Cappelli is vice president at New Science Associates, Inc., a consulting firm in Southport, Conn.

Compression getting hotter

BY MARY BRANDEL

At one time, the idea of compressing data on magnetic disks inspired fear — both of destroyed data and of intolerable performance. Today, data compression is coming of age, says Glen McDermed, program director of enterprise storage strategies service at Gartner Group, Inc. in Stamford, Conn.

The biggest force behind the growing acceptance is better software in the VSAM, DB2 and IMS environments (see chart at far right).

McDermed suggests buyers secure a copy of the software on a trial basis to test how well it compresses, what it does to the system's performance, its ease of use and whether it comes with adequate documentation.

At some point, he adds, vendors will start to offer data compression via hardware, which causes a new concern for today's software purchasers: ease of removal. "If you can compress data via hardware, you may want to remove the software."

Brandel is a *Computerworld* senior editor, product spotlight.

Top data compression vendors

- **BMC Software, Inc.** (Sugar Land, Texas)
- **Boole & Babbage, Inc.** (Sunnyvale, Calif.)
- **Database Technology** (Lake Bluff, Ill.)
- **Goal Systems International, Inc.** (Columbus, Ohio)
- **Infotel Corp.** (Tampa, Fla.)
- **Innovation Data Processing, Inc.** (Little Falls, N.J.)
- **Prime Factors, Inc.** (Eugene, Ore.)
- **Soft Works, Inc.** (Clinton, Md.)
- **Sterling Software, Inc.** (Woodland Hills, Calif.)

Source: Gartner Group, Inc. CW Chart: Michael Siggins

With more data stored on local-area networks and personal computers, another area of emerging importance is network storage management. Currently, vendors such as Epoch Systems, Inc. and Mountain Network Solutions, Inc. offer products to manage network storage in decentralized fashion from a file server.

But while these and several other vendors "do an outstanding job in the market segment they're in," McDermed says, no one has yet offered robust centralized network storage management from a mainframe. In addition, comprehensive network storage management products are concentrated in the Unix world. •

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Continued from page 51

citing superior price/performance.

Monitoring-type products are offered by Legent Corp., Candle Corp. and Boole & Babbage, Inc. These products help gather the endless bits of information and synthesize them, to be later assessed or simply stored. All data is gathered through IBM-dictated interfaces.

These products provide information on how efficiently resources are being consumed rather than improve performance by managing the actual resources. They also concentrate on different levels of the storage hierarchy and interlock pieces of SMS functionality with other pieces of the data center management puzzle.

Disk management software

In IBM mainframe sites, Computer Associates has lost the most market share, but it still leads the pack

Percent of installed market share

	1/86	7/91
Computer Associates International, Inc.	54%	44%
Innovation Data Processing, Inc.	14%	15%
IBM	5%	14%
Sterling Software, Inc.	10%	10%
Systems Center, Inc.	5%	10%
Legent Corp.	2%	3%
Blueline Software, Inc.	3%	2%
Other	7%	2%

Source: Computer Intelligence CW Chart: Michael Siggins

There are three reasons why these firms have decided on this strategy: the complexity of MVS; IBM's rock-hard adherence to an object-code-only policy; and the hard-to-decipher nuances of microcode functionality.

Legent's Astex manages the performance of DASD and cache memory as well. Users specify desired performance characteristics, and Astex manages DASD and attempts to manage cache on the fly by determining good and bad candidates for cache storage.

Boole & Babbage's DASD Advisor is a bit more restricted. This product is a rule-based system that manages DASD performance. It advises the operator on DASD use and suggests viable steps to take to minimize contention and consequently improve DASD performance. It does not yet dynamically manage cache.

With the acquisition of CDE Software last fall, Candle also entered the storage management marketplace with a suite of DB2 utility tools. DB2-DASD, for example, captures data that shows how DB2 is consuming the DASD resources and recommends how this consumption might be adjusted. While still a long way from full-blown system-managed storage, these tools can be integrated with Candle's automated products.

The difficulty in the IBM world is that many of the advances that SMS will realize will come more as a result of hardware and operating system enhancements than from the products. For instance, IBM has started to offer users the ability to add and dynamically reconfigure I/O resources as part of its Sysplex architecture. Even then, however, those capabilities are only exploited through specific operating system and subsystem enhancements.

Even managing hardware resources should not be expected from or delegated to an independent software vendor product. The myriad of fine-tuning controls that IBM increases with every new component release will still ultimately determine how resources are apportioned. Managing the cache is too closely coupled to hardware and operating system capabilities for the third-party products to handle.

An example of unfolding problems along these lines is found in the DB2 arena. Because no one is certain when and how IBM will enhance DB2, the third-party vendors are inhibited in their ability to provide DB2 SMS capabilities. IBM's DFSMS (through both DFP Media Manager and DFHSM) still only manages non-production system DB2 objects.

Third-party products in this area are limited to faster replacements for IBM's comprehensive DSNUTIL utility, as evidenced in product offerings from BMC Software, Inc. and Platinum Technology, Inc., among others. At the same time, DSNUTIL has improved in performance with the most recent version of DB2.

It is unlikely IBM's SMS goals will all be reached during the lifetime of its 390 mainframe. Incremental improvements will occur at a pace similar to SMS' evolution to date — slowly. From IBM's standpoint, improvements will come in the form of dragging new, high-margin I/O devices, such as optical storage and redundant array of inexpensive disks, or RAID, into the mainstream. This will just make it more important for third-party vendors to develop products that monitor the new devices. •

Other worlds

There's really only one primary option for storage management software in Digital Equipment Corp. shops: DEC's own Storage System Architecture (SSA). SSA tackles data migration, performance management, backup and recovery and other essential functions.

Some third-party vendors — including System Industries, Inc., Micro Technology, Inc. and Emulex Corp. — do offer DEC-compatible storage subsystems with bundled software drivers, says Bob Abraham, a consultant at Freeman Associates, Inc. in Santa Barbara, Calif. These either expand disk capacity or provide another storage media such as tape or optical disc.

On the other hand, vendor activity in Unix environments is pretty intense, especially at the mainframe level, says Ken Hallam, a partner at ENDL Associates, a market research firm in San Juan Capistrano, Calif. Each mainframe vendor tackles "the misery that Unix calls storage management" by bundling storage management functions in its version of the Unix operating system, Hallam says.

On smaller platforms, Epoch Systems, Inc. leads the market with a full suite of tools for both Unix and networked environments.

MARY BRANDEL

There's hope for data that's gotten out of hand

Whether on a small-scale or long-term implementation, users are finding new ways to scale down their DASD needs

BY LUCIE JUNEAU

Like many database managers, Bert Speed had a hunch that he could cut down on the amount of direct-access storage device (DASD) space that he set aside for his company's four DB2 systems. Until recently, however, he had no way of measuring how much — or how little — storage those databases required.

"We knew we had a lot of space tied up out there, but we didn't know how much of that we were using," says Speed, a database analyst at The Williams Cos. in Tulsa, Okla.

When he tried out DB2-DASD, a space analysis tool from Candle Corp., last fall, Speed confirmed that hunch: 50% of the allocated space was going unused. Today, using DB2-DASD on a daily basis, Speed's department has cut the amount of unused space to between 5% and 10%.

The company has been able to retrieve roughly 2.8G bytes of DASD. Speed estimates that the tool — which ranges in price from $8,000 to $32,000 — will pay for itself within a year.

■ ■ ■

The reality that DASD proliferation was getting out of hand hit home for Robert Hansen when he literally started tripping over storage units.

"We were running out of room in our data center because we had so much DASD on the floor," says Hansen, supervisor of storage management at Ford Motor Co. in Dearborn, Mich.

That was prior to 1987, when the company started using IBM's Hierarchical Storage Manager (HSM) for storage pooling. Since then, "we've improved disk utilization by about 15%," says Hansen, who oversees three job entry subsystem complexes of IBM 3090 Class 600 and higher machines.

In early 1990, Hansen boosted efficiency even further by adding IBM's System Managed Storage (SMS — see story page 51). With these products, Ford has been able to freeze — and even decrease — its magnetic disk capacity.

Whereas storage was growing by about 1T byte per year in 1988 and 1989, "we cut back to about 300G bytes of growth in 1990," Hansen says. "Right now, we're probably in the neighborhood of 500G bytes under forecast, and we're actually achieving a negative growth. We're at about 100G bytes less than we started the year with."

Moving data to secondary storage areas is the key to Ford's successful conservation of DASD. SMS offers significant efficiencies by controlling the migration of data at the data set level rather than simply at the data pool level, Hansen notes.

"Working at the pool level, all of the data had to migrate at one time. Working at the data set level, we can offload a lot of data off primary disk a lot sooner than before," Hansen says.

There are more than 700,000 data sets under SMS/HSM control at Ford, Hansen says. The firm is still in the process of fully implementing SMS, looking into how it might use SMS to improve database management, for example. Hansen also plans to bring system support data sets under the SMS umbrella, he says.

■ ■ ■

Moving data off DASD to a less expensive storage medium is no longer limited to mainframe-level setups. Nor does older data have to be stored on tape.

At the Institute for Naval Oceanography near Bay Saint Louis, Miss., computer center manager Don Goff has a system that automatically moves data from magnetic disks on workstations to a magneto-optical disc file server jukebox from Epoch Systems, Inc. in Westboro, Mass.

The server sits on a 50-user network linking workstations from Sun Microsystems, Inc. and Silicon Graphics, Inc.

Because the institute performs ocean modeling, "we needed some way to store large data sets without requiring a massive amount of magnetic disk space," Goff says.

Not only is optical disc space much less expensive than magnetic storage, but the Epoch-1 Infinite Storage jukebox server also moves data between the two media transparently.

When the amount of data stored on a workstation's disk reaches a predefined level, the Epoch system automatically migrates the least active files on that disk to the Infinite Storage server. Whenever the user accesses data residing on an optical platter on the server, the data is returned to the local disk within seconds.

On the previous system, old data was moved to tape, which operators had to access for users.

The Epoch system cost Goff about $160,000 and was expected to pay for itself in two to three years. However, Goff says, the institute's data needs are expanding more quickly than anticipated, and the payback may come sooner. •

Juneau is a free-lance writer and editor based in Salem, Mass.

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Disk arrays: Hype vs. reality

BY MIKE CASEY

If you believe some storage vendors, the next wave of primary data storage is already upon us: redundant arrays of inexpensive disks (RAID). According to these vendors, RAID's benefits are many:

- Increased storage capacity per logical disk volume.
- High data transfer or I/O rates.
- Fault-tolerant storage.
- Lower cost per 1M byte.
- Improved use of data center floor space.

Not all RAID systems, in fact, offer all of these benefits, and even among those that do, some critical distinctions exist. Computer scientists at the University of California separate RAID products into six categories.

Products that are purely RAID-0 are technically not RAID systems at all, since there is no parity or error correction data stored to provide redundancy in the event of a system failure.

The potential risk of data loss presents a major drawback of RAID-0 systems. One way in which RAID-0 vendors are adding fault tolerance is by including a RAID-1 option on their systems.

On the positive side, data transfer rates are high with RAID-0 because user data is striped across several disks. Overhead costs are also lower than they would be for a true RAID configuration that provides fault tolerance.

With RAID-1, duplicate data is stored on separate disk drives. This approach — often described as disk mirroring or shadowing — ensures that critical files will be available in case of individual disk drive failures.

Some applications, such as certain software engineering environments, might require only a small percentage of the total data to be mirrored.

Others — such as those that include real-time data acquisition, imaging or commercial transaction processing — cannot tolerate occasional loss of data or even temporary loss of access. Such applications need fault-tolerant storage; since mirroring can be an expensive solution, RAID-3 and RAID-5 disk arrays are proposed as cost-effective ways to provide fault tolerance and high performance.

Hamming code is stored on additional disk drives and is used for error detection and correction. This is not a widely used design: Since the error detection function is already incorporated into most disk drives and their controllers, RAID-2 is redundantly redundant.

User data is striped in parallel across several disks, and error-correction data is stored on a dedicated parity disk. The array functions as one large, logical drive.

This configuration is considered most suitable for applications that require high data transfer rates when writing and reading large files. Using one parity drive for five or 10 data drives, a RAID-3 configuration can provide fault-tolerant storage with only 10% or 20% parity overhead cost, compared with 100% for a mirrored disk solution.

User data is stored and retrieved using independent writes and reads to several data drives. Error correction data is stored on a dedicated parity drive. In a simple RAID-4 design, the write performance of the array is reduced because each write operation to a data drive must also write to the parity drive. This may be acceptable in read-intensive applications.

User data and parity data is interleaved and striped across several disks. There is no dedicated parity drive.

This design allows data to be written simultaneously to two or three separate drives and reduces the performance penalty experienced by write-intensive applications.

The RAID-5 configuration is considered most suitable for applications that

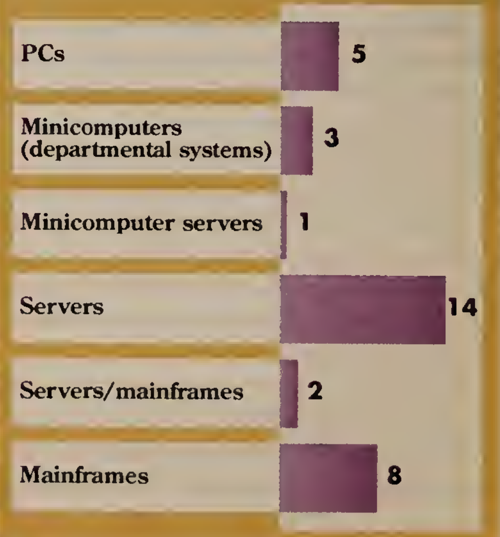
Continued on page 55

Casey is director of storage industry research at Computer Intelligence/Infocorp in Santa Clara, Calif.

It's a RAID

Servers are by far the most popular platform for first-time implementations of redundant arrays of inexpensive disks

Number of respondents: 33



Source: Sierra/Alliance

CW Chart: Michael Siggins

MAXELL. VERY BIG IN OPTICAL DISK TECHNOLOGY.

Long recognized around the world as the leader in data storage, Maxell expertise in optical disk technology should come as no surprise.

In our full family of optical disk products — from 12″ and 5¼″ WORM to 5¼″ and 3.5″ Rewriteable — it's an expertise that's led to low raw bit error rates, providing faster, more efficient performance.

The same expertise, backed by a state-of-the-art R&D facility, has fostered the development of such innovations as on-land recording methods for a higher carrier to noise ratio, translating into cleaner, sharper images. And to a new 12″ WORM disk offering 7 gigabytes of storage.

What's ahead? New ideas, of course. And close and continuous involvement with major drive manufacturers.

Because Maxell is fully involved and truly committed to optical disk technology.

Continued from page 54

require a high number of I/O operations per second, such as transaction processing tasks that involve writing and reading large numbers of small data blocks at random disk locations.

Current RAID-5 designs address what has been a significant disadvantage of some RAID-4 and RAID-5 approaches — reduction in throughput for write-intensive applications — by supporting a mix of configurations.

This makes it possible to have RAID-1 sets of mirrored disk drives for write-intensive applications, RAID-3 arrays for high data rate file systems and RAID-5 arrays for read-intensive transaction processing applications.

Several vendors are developing enhanced configurations and are promoting the products as RAID-7 and RAID-5 Plus. Most of these RAID improvements involve caching schemes that increase performance.

Users should look past the hype and evaluate the storage technology in terms of their applications needs. Where very high data rates or very large files are required, a RAID-0 disk array may be appropriate.

If continuous data availability is needed, fault tolerance becomes important. RAID-1 can do the job, but a RAID-5 solution may be more cost-effective.

If the proposed RAID solution involves reduced performance in write-intensive applications, some disk array system vendors will offer software that measures or tunes performance on the user's application mix. •

In real life

Most RAID products are RAID-0 and RAID-1. Of the available RAID-4 and RAID-5 systems, many have been implemented as relatively simple local-area network server designs.

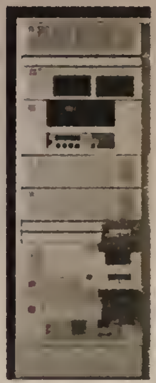
Mainframe disk arrays should be widely available by late 1992. Storage Technology Corp. has invested massive resources in microcode development for its forthcoming Iceberg product.

Some notable RAID products and components that have either reached market or will soon ship include the following:

- **The Symmetrix disk array system from EMC Corp. in Hopkinton, Mass.** This RAID-0 product is intended as a storage subsystem for IBM mainframe users. Symmetrix models based on 1G-byte drives from Seagate Technology, Inc. offer disk capacities of up to 24G bytes with cache memory capacity of up to 3G bytes.
- **Santa Clara, Calif.-based Auspex Systems, Inc.'s RAID-0 NS-5000 disk array server for the Unix environment.** An interesting feature of the Auspex design is the use of virtual disk partitions: Selected physical partitions of two or more disk drives can be linked together logically for disk spanning, striping or mirroring.
- **Storage subsystems based on array controllers made by Maximum Strategy, Inc. or Storage Concepts, Inc.** These subsystems support a number of recently announced RAID-3 implementations and are sold for use in technical applications on supercomputers and Unix servers from Alliant Computer Systems Corp., FPS Computing, IBM, Maspar Computer Corp. and others.
- **The Compaq Computer Corp. Systempro configured for RAID-4 implementation.** The optional Data Guarding mode can be used with an array of four internal 3½-in. disk drives from Conner Peripherals, Inc. Compaq also supports RAID-1 operation (mirrored disks) for the internal disk array and an external expansion array based on 5¼-in. drives.
- **RAID-5 disk array systems that support flexible RAID configurations.** These systems allow users to configure some of the disk drives as RAID-0 or RAID-1 storage, while other drives are addressed as RAID-3 or RAID-5 disk arrays.

Some examples include disk array systems designed by SF2 Corp. for the Digital Equipment Corp. VAX market; by NCR Corp. for use in its new line of midrange systems; by Data General Corp. for its Aviion systems; and by Array Technology Corp. for use in products from NCR, Storage Tek's Iceberg and other system vendors.

MIKE CASEY



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SYSTEMS

BUYERS' SCORECARD

Amdahl, Hitachi tie for top DASD user ratings

COMPUTERWORLD BUYERS' SCORECARD

DASD

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: 30; Hitachi Data Systems Corp.'s 7390: 20

Product	Three highest ratings	Three lowest ratings
Amdahl Corp.'s 6380 SCORE 73	Compatibility with installed hardware Ease of operation Reliability	Cost per 1M byte of cache Effectiveness of cache features Floor space requirements
HDS' 7380 SCORE 73	Reliability Compatibility with installed hardware Overall performance	Effectiveness of cache features Cost per 1M byte of cache Cost per 1M byte of storage
HDS' 7390 SCORE 71	Reliability Compatibility with installed hardware Efficient access to external databases	Cost per 1M byte of cache Effectiveness of cache features Quality of service and technical support
IBM's 3390 SCORE 66	Overall performance Reliability Ease of operation	Acquisition and maintenance costs Cost per 1M byte of cache Cost per 1M byte of storage
IBM's 3380 SCORE 65	Quality of service and technical support Reliability Ease of operation	Cost per 1M byte of cache Acquisition and maintenance costs Floor space requirements

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Newer isn't always better, according to 140 users of high-end disk drives surveyed in Buyers' Scorecard. The users rated the previous generation of direct-access storage devices (DASD) from Amdahl Corp., IBM and Hitachi Data Systems Corp. higher than the new generation in 11 of 13 categories.

The highest scores overall were given to Amdahl's 6380 and HDS' 7380. These two products tied for top position with scores of 73 out of 83 possible points.

The survey rated the last two generations of drives from the three leading vendors in the IBM and compatible DASD market.

Each product was rated by thirty users, with the exception of HDS' 7390, which had a response base of 20. Separate surveys were conducted for each product, although the majority of those surveyed use a mix of the products presented.

Ratings are based on an average of all responses for each user group surveyed. Total scores are based on these averages multiplied by an importance factor assigned to each category by all 140 users (see methodology next page).

IBM's 3390, which has been shipping in volume for more than 20 months, came out on top in only a single category — effectiveness of cache features — and, in that instance, actually tied with its predecessor, the 3380. The 3380 achieved higher ratings than the 3390 in acquisition and maintenance costs, compatibility and support.

Overall, however, users registered a higher level of satisfaction with the 3390 than with the 3380 by rating it stronger in seven categories, including reliability, performance and cost per 1M byte.

Despite IBM's lock on its corner of the DASD market (it owns 75% of the installed base at IBM and compatible mainframe sites worldwide), Amdahl and HDS have steadily growing and apparently satisfied user bases. HDS' latest drive, the 3390-compatible 7390, achieved higher ratings than the 3390 in all but four categories and topped all drives in ratings for floor space requirements.

HDS' 7380 fared even better, achieving the highest rating in the category most important to users: reliability. The 7380 also topped the following categories: quality of service and technical support and overall performance. The drive tied with Amdahl's 6380 in the categories of environmental controls and learning curve required to get the product up and running.

Amdahl, which hasn't yet started shipping its 3390-compatible 6390 in volume, achieved some of the strongest ratings overall for its 6380, including topping six categories: hardware compatibility, cost per 1M byte of storage, cost per 1M byte of cache, acquisition and maintenance costs, ease of operation and ease of expansion.

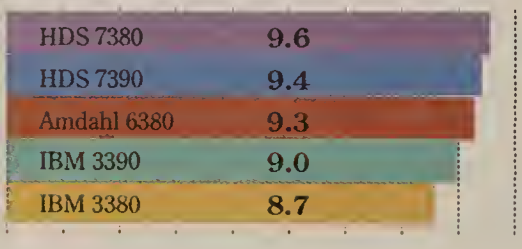
Respondents said they would like to see the vendors add several features to their products, such as the following: a smaller footprint, more performance enhancements, more cache features, greater storage capacity and a stronger control unit. •

KEY RATINGS

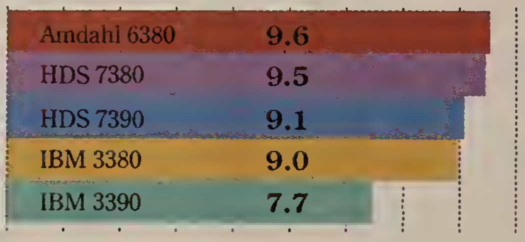
HDS' 7380 and Amdahl's 6380 each achieve the highest ratings in three of six categories rated most important by users. IBM's 3380 ties for second with the 6380 for quality of service and technical support. The 3390 achieves third position in overall performance.

User importance rating:

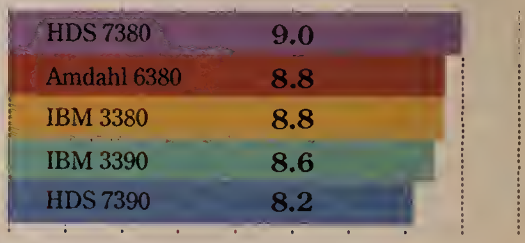
9.5 Reliability



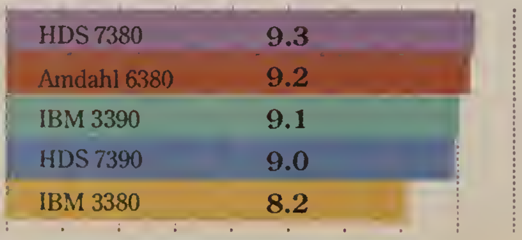
9.1 Compatibility with installed hardware



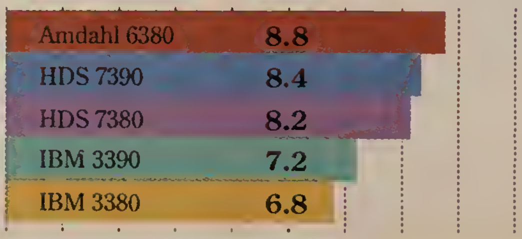
9.0 Quality of service and technical support



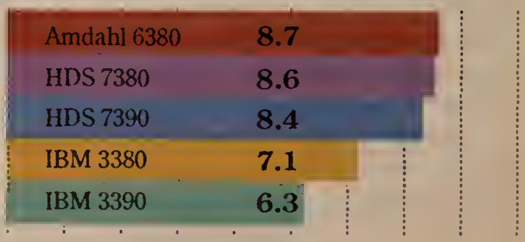
8.9 Overall performance



8.6 Cost per 1M byte of storage



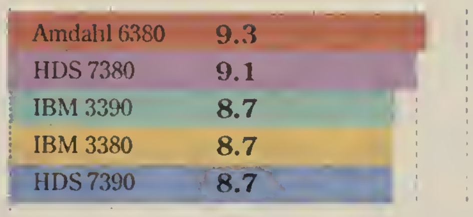
8.4 Acquisition and maintenance costs



A CLOSER LOOK

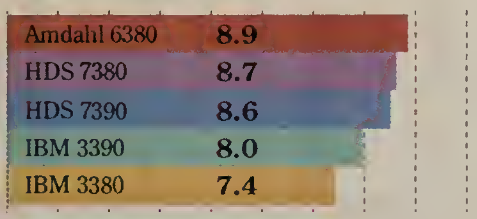
IBM's 3390 and 3380 are rated highest in effective cache features, but otherwise, the Amdahl 6380 and HDS' products achieve the strongest ratings from their users. The 6380 tops three categories, while the HDS 7390 rates highest in floor space requirements.

7.8 Ease of operation

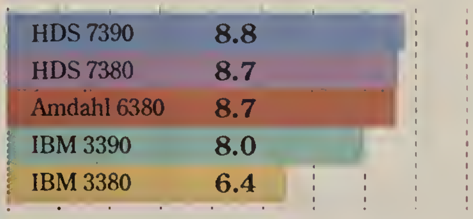


User importance rating:

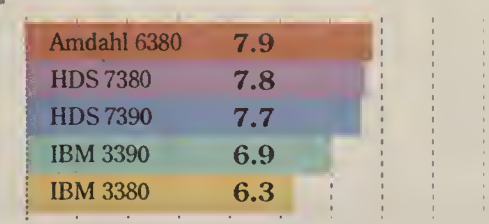
7.8 Ease of expansion



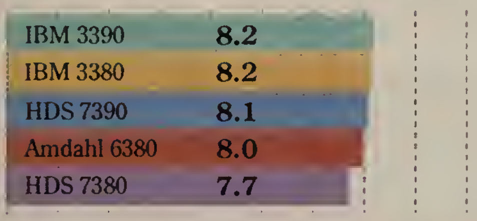
7.8 Floor space requirements



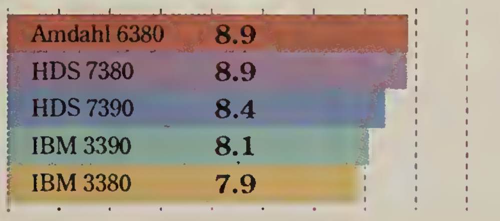
7.8 Cost per 1M byte of cache



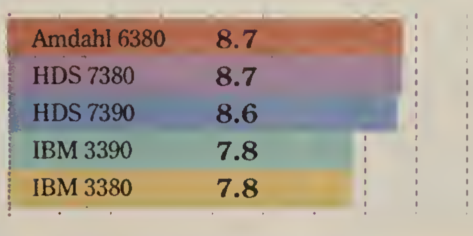
7.7 Effectiveness of cache features



7.7 Efficient environmental controls



7.5 Learning curve

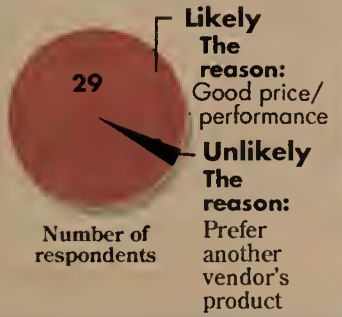


Loyalties

How likely would you be to purchase this product again if you were making a decision today?

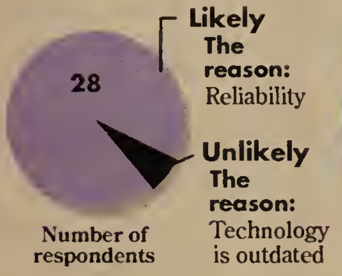
Amdahl 6380

Response base: 30



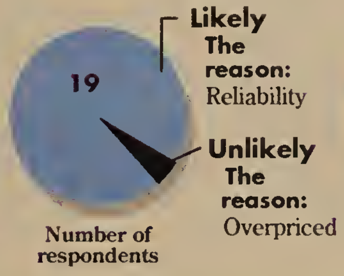
HDS 7380

Response base: 30



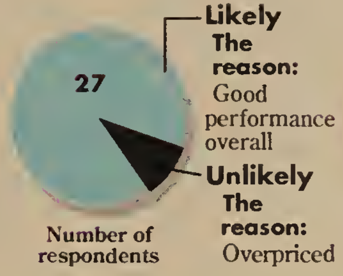
HDS 7390

Response base: 20



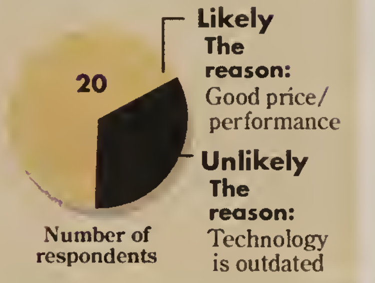
IBM 3390

Response base: 30



IBM 3380

Response base: 30



Verbatim

What are the major strengths and weaknesses of this product?

(Responses are based on the most frequently stated answers.)

	Amdahl 6380	HDS 7380	HDS 7390	IBM 3390	IBM 3380
Strengths	Reliability/stability	Reliability	Reliability	Reliability	Strengths
	Price/performance	Price/performance	Price/peformance	Compact, saves space	Reliability
	Service and support	Compact, saves space	Compact, saves space	Cache speed	Price/performance
Weaknesses	Too expensive	Too expensive	Lags behind in technology	Too expensive	Too large
	Too large	Too large	Not enough features/functions	Poor compatibility	Lags behind technology
	Lags behind in technology	Service and support	Poor compatibility	Too large	Too expensive

Vital statistics

With what mainframe are you running this product?
(multiple responses allowed)

IBM 3090	42%
Amdahl Corp.	25%
Hitachi Data Systems Corp.	15%
Other	12%
IBM 4381	7%
IBM 3081	4%
IBM 3083	3%

Do you use caching features to increase performance?

Yes	63%
No	31%
Don't know	6%

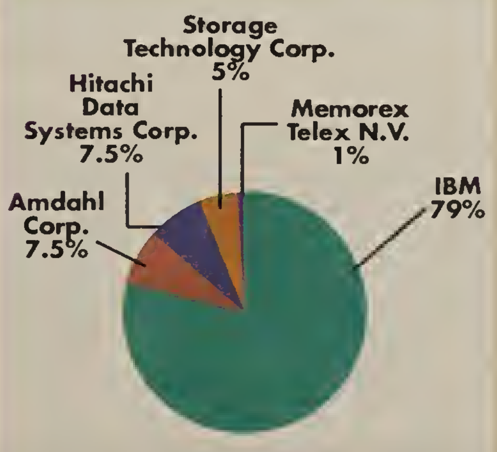
What is your position?

Manager	53%
Director	25%
Staff member	11%
Other	11%

How many years have you been involved with storage products?

Five or more	90%
Three to four	8%
One to two	1%
Less than one	1%

U.S. market share IBM/plug-compatible mainframe DASD



Based on 1990 installed systems
Total number of systems: 181,955

Source: International Data Corp.

METHODOLOGY

To qualify for *Computerworld*'s Buyers' Scorecard on high-end disk drives, a product had to be among the latest systems from the top three vendors in installed base and 1990 shipments.

Scores are based on 30 responses per product, except in the case of the 7390, which just began to ship in volume this year. The telephone survey was conducted and tabulated by First Market Research in Austin, Texas. User names were obtained from nonvendor sources. Criteria were developed in consultation with experts who follow the technology.

Ratings are based on a 1-to-10 scale (1 is very poor and 10 is very good). Scores are calculated by taking the average of user ratings for each criterion and multiplying it by the importance weightings users assigned to each criterion.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and organizations for their assistance in producing this Buyers' Scorecard: Computer Intelligence; David Vellante and Steve Josselyn at International Data Corp.; and Bob Abraham at Freeman Associates, Inc.

Storage management software

VENDOR	PRODUCT	MAJOR FUNCTIONS	INTEGRATES PRODUCTS WITH	HARDWARE REQUIREMENTS	SOFTWARE REQUIREMENTS	MEMORY REQUIRED (BYTES)	DISK SPACE REQUIRED (BYTES)	TYPES OF STORAGE MEDIA MANAGED	FACILITATES VOLUME POOLING	REPORTS GENERATED	ON-LINE REPORTING	AUTOMATIC DATA BACKUP	NETWORKS SUPPORTED	ANNUAL MAINTENANCE FEES	PRICE RANGE
A+ Software, Inc. **(315) 685-6918**	DASD/Plan	Space management, disk space utilization reporting, real-time/on-line reporting	Storage management products	IBM MVS-compatible	MVS/SP, MVS/XA, MVS/ESA	4M	10M	Disk	Yes	Full management reports by pool	Yes	Individual data sets, volumes	VTAM	15% of license fee	$5,000 - $10,000
Advanced Software Products Group, Inc. **(813) 649-1548**	DASDtrak	Space management, disk space utilization reporting, real-time/on-line reporting, volume allocation, budgeting	None	IBM MVS-compatible	MVS/SP, MVS/XA, MVS/ESA	20K - 50K	20M	Disk	Yes	Owner space allocation	Yes	None	Host-oriented for DASD control	15% of license fee	$16,900 - $22,900
Astco Ltd. **(301) 424-9455**	Astute	Space management, disk space utilization reporting, real-time/on-line reporting, catalog management, budgeting, data set management, standards enforcement	None	IBM MVS-compatible	MVS/ESA, MVS/XA, MVS or VSI	1M	10M	Disk, tape	Yes	Customizable	Yes	None	None	15% of license fee	$10,000 - $35,000
Avtech Software, Inc. **(714) 957-1978** **(800) 421-3941**	Ability VSM	Space management, performance monitoring, data migration, disk space utilization reporting, disk and file access, security management, file ownership, file management	Performance and storage management, data security and process management products	VAX/VMS	VMS Version 4.4 and above	NA	.7M	Disk	Yes	Unlimited	Yes	None	Ethernet and clustered systems	Approximately 15% of license fee	$695 - $7,495
Bear Computer Systems, Inc. **(818) 341-0403**	D-MON Disk Monitor	Space management, disk space utilization reporting, real-time/on-line reporting, automated data migration	None	DEC VAX, Microvax	VAX/VMS	NA	.3M	Disk	No	Disk usage by directory, history by directory/by user	Yes	User-defined	None	15% of purchase price	$995
BGS Systems, Inc. **(617) 891-0000**	Best/1 DASD Consultant	Space management, performance monitoring, disk space utilization reporting, volume allocation, automated data migration	Performance management products	IBM 370/390 architecture, MVS, VM or compatible	PL, ISPF, GDDM	4M	3.6M	Disk	Yes	Extensive device, data set and work load	Yes	None	SNA	$5,000	$20,000 - $25,000
Blueline Software, Inc. **(612) 542-1072** **(800) 826-0313**	Vital signs	Space performanace, performance monitoring	None	Any IBM 370- or 390-class processor	VM/SP, VM/HPO, VM/XA, VM/ESA	4M	2M	Disk	No	DASD seek analysis	Yes	None	None	15% of license fee	$325 - $385 per month for three-year buyout
BMC Software, Inc. **(713) 240-8800**	DASD manager for DB2	Space management, performance monitoring, disk space utilization repeating	Performance and storage management products	IBM-compatible	MVS/XA, ISPF, DB2	NP	47M	Disk	No	QMF	Yes	Individual data set, data set groups	IBM-compatible	20% of license fee	$15,000
Candle Database Tools Division **(713) 260-1700**	DB/DASD for DB2	Space management, disk space utilization reporting, direct and recover over allocated space	Performance and storage management products	IBM 3000 and 4300	MVS/ESA, MVS/XA, MVS/SP	2M	35M	Disk	No	DASD analysis and tuning	Yes	NP	None	20% of list price	$8,000 - $32,000
Compute (Bridgend) Ltd. **(416) 746-4447** **(800) 388-6123**	CBLVCAT	Space management, performance monitoring, disk space utilization reporting, volume allocation, catalog management, device and operating system migration	None	All IBM and compatible mainframes	VSE, MVS, VM	150K	100K	Disk	No	General, monitoring, tuning, modeling, customizable	Yes	None	None	10% of purchase price	$3,760 - $24,500
	Selcopy	Data compression, automated data migration, file exploration and modification, file generation, backup, reporting	None	IBM-compatible mainframes	VSE, MVS, VM	300K	150K	Disk, tape, card, diskette	No	User-specific	Yes	Individual data sets, multiple files	None	10% of purchase price	$1,700 - $44,250
Computer Associates International, Inc. **(516) 227-3300**	CA-ASM/Archive VSE	Automated data migration, automated archiving, automated hierarchical storage management for VSE	Performance management products	IBM 370/390 architecture	VSE/SP, VSE/ESA	Configuration-dependent	Configuration-dependent	Disk, tape	Yes	Complete catalog disk space, backup inventory	Yes	Individual data sets, volumes, VSAM catalog	None	15% of maintenance use	Contact vendor
	CA Archiver	Data compression, on-line reporting, automated archiving and data migration	None	DEC VAX/VMS environment	VMS 4.4	NA	3.4M	Disk, tape, optical disc	No	Archival information reports	Yes	Individual data sets, volumes	None	Contact vendor	Contact vendor
	Unipack/ASM	Space management, performance monitoring, disk space utilization and real-time/on-line reporting, volume allocation, catalog management, automated archiving and data migration, budgeting, tape management, error recovery	Performance and storage management products, security, automated production center	IBM mainframes	MVS	1M - 5M of virtual storage	150M	Disk, tape	Yes	Static and dynamic, standard and customized, inventory and exceptions	Yes	Individual data sets, volumes, explicit or incremental	MVS VTAM	15% of current list price	Contact vendor
	CA Dynam VSE	Space management, disk space utilization reporting, real-time/on-line reporting, volume allocation, catalog management	Performance and storage management control, automotive products	IBM 370/390 architecture	VSE/SP, VSE/ESA	Configuration-dependent	Configuration-dependent	Disk, tape	Yes	Complete catalog, disk space, pool, volume	Yes	None	NP	15% of usage and maintenance	Contact vendor
Computertime Network Corp. **(514) 633-9900**	Archive*SQL	Space management, data compression, real-time/on-line reporting, volume allocation, catalog management, automated archiving, and data migration, archiving relational databases, heterogeneous backup	None	VAX or any Unix platform	VMS, Unix	.5M	8M	Tape, disk, optical disc, jukeboxes, laser disc	Yes	User-defined	Yes	Individual data sets, volumes	Decnet, TCP/IP	15% of list price	$4,000 - $36,000
Demax Software, Inc. **(415) 341-9017** **(800) 283-3629**	Pakmanager	Space management, performance monitoring, disk space utilization reporting	Storage management products	VAX	VMS	512 bytes	512 bytes	Disk	No	Usage summaries, disk performance manager	Yes	None	None	$80 - $1,350	$395 - $6,755
	Distributed Disk Manager (DDM)	Space management, performance monitoring, disk space utilization reporting	Storage management products	VAX	VMS	512 bytes	512 bytes	Disk	No	Volume status, summary, characteristics, inventory	Yes	None	Decnet	20% of initial configuration	$10,000 client; $200 - $3,375 agent
Design Strategy Corp. **(212) 370-0000** **(800) 331-8726**	DASD Inventory	Space management, disk space utilization reporting	None	IBM mainframe	VSE, MVS	1.5M	.8M	Disk	No	Summary and detail reports on DASD use by file and/or volume	No	None	IBM-compatible mainframe	10% of list price	$2,500 - $5,500

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

VENDOR	PRODUCT	MAJOR FUNCTIONS	INTEGRATES PRODUCTS WITH	HARDWARE REQUIREMENTS	SOFTWARE REQUIREMENTS	MEMORY REQUIRED (BYTES)	DISK SPACE REQUIRED (BYTES)	TYPES OF STORAGE MEDIA MANAGED	FACILITATES VOLUME POOLING	REPORTS GENERATED	ON-LINE REPORTING	AUTOMATIC DATA BACKUP	NETWORKS SUPPORTED	ANNUAL MAINTENANCE FEES	PRICE RANGE
Digital Equipment Corp. **(508) 493-5111**	SLS, VPA, SPM, VMS	Space management, performance monitoring, data compression, disk space utilization reporting, real-time/on-line reporting, volume allocation, catalog management; special setup required for automated data migration and archiving	None	VAX	VMS	Configuration-dependent	Configuration-dependent	Disk, tape, optical disc	Yes	Depends on product	Yes	Individual data sets, volumes	Decnet	$28 for SLS remote on VAX, $7,530 for SLS full on VAX 9000-410 and up	$175 for SLS remote on VAX to $32,700 for SLS full on VAX 9000-410
Discos Division of General Atomics **(619) 455-3753**	Unitree	Space management, volume allocation, catalog management, automated archiving and data migration, hierarchical file and storage management	Storage management products	Server platform, including disk cache, optical disc robot, tape cartridge robot, manually mounted tape	Unix	24M	60M	Disk, tape, optical disc, jukeboxes, cartridge robots	Yes	Accounting, data management activity	Yes	Individual data sets, files	Ethernet, FDDI, Hippi, Hyperchannel, Ultranet	10% of license fee	$6,250 and up
Empact Software, a Boole & Babbage Co. **(404) 483-8852**	Stop-X37	Space management, volume allocation	None	IBM-compatible mainframes	MVS/SP, MVS/XA, MVS/ESA	50K	1.224M	Disk	Yes	SMF reports, activity reports, cost savings	No	None	None	20% of purchase price	$7,500 - $34,000
	Pool-DASD	Space management, volume allocation and control	None	IBM-compatible mainframes	MVS/SP, MVS/XA, MVS/ESA	58K	3.042M	Disk	Yes	None	No	None	None	20% of purchase price	$5,500 - $21,100
	Budget DASD	Space management, budgeting	None	IBM-compatible mainframes	MVS/SP, MVS/XA, MVS/ESA	68K	2.448M	Disk	No	Maximum space allowed, current space used, space trends, summary reports	Yes	None	None	20% of purchase price	$5,500 - $21,100
Enhanced Software Products, Inc. **(617) 235-7367**	ESP-Tempd	Space management, volume allocation	None	IBM 370 architecture	VM/CMS	50K	1M	Disk	No	None	No	None	None	18% of license fee	$4,000 - $8,000
Epoch Systems, Inc. **(508) 836-4300**	Renaissance Migration	Space management, automated data migration, disk space utilization reporting, real-time/on-line reporting, volume allocation, automated archiving	Storage management products	Sun 3 or Sun 4	SunOS 4.X or greater	1M	4M	Disk, tape, optical disc	Yes	Migration, space utilization, location control, file aging, inventory	Yes	Data sets, volumes	TCP/IP	Configuration-dependent	$750 - $7,500
Goal Systems International, Inc. **(614) 888-1775** **(800) 892-9002**	Epic for VSE	Space management, disk space utilization reporting, real-time/on-line reporting, disk and tape management	Job scheduling product	All IBM tape and DASD	VSE/SP, VSE/ESA, VSE/advanced function	Partition GETVIS 22K, SVA 275K	6M	Disk, tape	Yes	All types, including activity, data set and tape, scratch	Yes	Data sets, volumes	None	Contact vendor	Contact vendor
	Epic for CMS	Automated archiving, tape management, backup/restore, archive/retrieve	Performance and storage management products	All IBM and compatible DASD	VM/SP 3 and above	1M	NA	Tape	Yes	Full reporting	Yes	Data sets, volumes	None	Contact vendor	Contact vendor
IBM **(914) 642-5553**	DFSMS/MVS	Space management, performance monitoring, data compression, disk space utilization reporting, real- time/on-line reporting, volume allocation, catalog management, automated data migration, budgeting	Storage management, security and sorting products	MVS processor for base function; extra function with ESA-capable processor and 3990-3 storage controller	MVS/XA, MVS/ESA, DFP V3, DFHSM, DFDSS, RACF, DFSORT	NA	NA	Disk, tape, optical disc, expanded storage	Yes	ISFM (ISPF), DFHSM or flat file as input to other packages or products (SLR, SAS)	Yes	Many, including individual data sets, volumes, control data sets, VTOCS	None	None	Price varies on CPU
	DFSMS/VM FL210 on VM/ESA 1.0 ESA feature	Space management, disk space utilization reporting, real-time/on-line reporting, volume allocation, catalog management, automated data migration	None	ESA	VM/ESA 1.0, ESA feature, ISPF, DIRMPINT or equivalent	NA	NA	Disk	Yes	Minidisk inventory list, minidisk utilization	Yes	None	None	None	Contact vendor
Information Management Software, Inc. **(416) 427-9742**	Dascomp	Space management, data compression	None	IBM 3090, 360, 370 architecture, 3080, 80386-based machines	MVS/XA, VM, VMS, DOS, Unix	128K minimum	Dependent on data files	Disk	No	Performance reports	No	Individual data sets, volumes	None	15% of license fee	$14,000 MVS, $9,995 VM, $2,995 VMS, $395 PC
Innovation Data Processing, Inc. **(201) 890-7300**	Fast Dump Restore	Space management, data migration, disk space utilization reporting, archiving, DASD dump, restore, disaster recovery	Storage management products	IBM 370 architecture through ES/9000	IBM MVS through ESA (stand-alone)	Less than 1M	5M	Disk	Yes	Amounts of data moved, names of data sets moved, recommendation	Yes	Individual data sets, volumes	TSO	$850	$5,000
	Compaktor	Space management, data compression, disk space utilization reporting, real- time/on-line reporting, volume-level space management	Storage management products	IBM 370 architecture through ES/9000	IBM MVS through ESA	Less than 1M	5M	Disk	Yes	Free space utilization, data set allocation information	Yes	Volumes	TSO	$500	$3,000
	Automatic Backup and Restore	Space management, data compression, disk space utilization reporting, real- time/on-line reporting, automated archiving, automated data migration, site/Sysplex, level space management	Storage management products	IBM 370 architecture through ES/9000	IBM MVS through ESA	Less than 1M	5M	Disk	Yes	DASD management, volume usage, archive	Yes	Individual data sets, volumes	TSO	$1,350	$10,500
	Innovation Access Method	Space management, data compression, disk space utilization reporting, real- time/on-line reporting, performance accelerator for VSAM	None	IBM 370 architecture through ES/9000	IBM MVS through ESA	Less than 1M	5M	Disk	Yes	Data set activity and space usage	Yes	None	TSO	$4,000	$30,000
International Structural Engineers, Inc. **(213) 643-7310**	Media/Schedule/Vault	Space management	Storage management products	VAX	VMS	1M	2M	All, including disk, tape, jukebox, diskette	Yes	Standard, custom	Yes	Individual data sets, volumes	Decnet	15% after first year	$1,100 - $14,000
Legent Corp. **(703) 734-9494**	Optimodel	Performance monitoring, on-line reporting, capacity planning	Storage, performance and capacity management products	IBM or compatible 80386, PC, one parallel port, EGA or VGA card, IRMA 3270 emulation card or equivalent, mouse	Models MVS/X or MVS/ESA environments, requires DOS 3.3	3M - 4M recommended	10M	Disk, cache	Yes	Bottleneck analysis, resource consumption, configuration and migration analysis, calibration, multiple logical partition	Yes	None	None	20% of license fee	$18,000 - $37,000
	MICS DASD Space Products	Space management, disk space utilization reporting, volume allocation, catalog management	Storage management products	MVS	MVS, MICS platform	NA	NA	Disk, tape, HSM (ML1, ML2)	Yes	Space efficiency reports	Yes	None	None	30% of license fee	$8,900 - $14,700

VENDOR	PRODUCT	MAJOR FUNCTIONS	INTEGRATES PRODUCTS WITH	HARDWARE REQUIREMENTS	SOFTWARE REQUIREMENTS	MEMORY REQUIRED (BYTES)	DISK SPACE REQUIRED (BYTES)	TYPES OF STORAGE MEDIA MANAGED	FACILITATES VOLUME POOLING	REPORTS GENERATED	ON-LINE REPORTING	AUTOMATIC DATA BACKUP	NETWORKS SUPPORTED	ANNUAL MAINTENANCE FEES	PRICE RANGE
Legent (cont.)	MICS Storagemate	Space management, disk space utilization reporting, performance monitoring, automated data migration, volume allocation, capacity management	Performance, storage and capacity management products	MVS	MVS, MICS platform, MICXS MVS batch and operating analyzer, MICS MVS hardware and SCP analyzer, MICS DASD Space Products, Astex (optional)	NA	NA	Disk, tape, cache, system managed storage, HSM (ML1, ML2)	Yes	Problem management, data set standards, volume grouping, space availability, SMS migration/tracking, ACS simulation, etc.	Yes	None	None	20% of initial license fee	$9,900 - $19,900
	Astex	Performance monitoring, real-time/on-line reporting	Storage management product	IBM 370 architecture, ES/9000 and PCM	MVS/XA and ESA	1M	2.5M	Disk, cache controllers	Yes	DASD and cache utilization and response time	Yes	None	IBM SNA (mainframe-based)	15% of current license fee	$15,000 - $45,000
Macro 4, Inc. **(201) 895-4800**	VSAM Tune	Space management, performance monitoring, disk space utilization reporting, real-time/on-line reporting, catalog management, automated VSAM reporting, automated VSAM tuning	Storage management products	IBM-compatible	VM, VSE, MVS	40K	Less than 1M	Disk	No	Tune reports, detail, volume/catalog utilization	Yes	None	None	15% of purchase price	$16,450 - $26,600
Micro Technology, Inc. **(714) 970-0300**	Virtual Library Manager	Space management, automated data migration, disk space utilization reporting, real-time/on-line reporting, automated archiving	Performance and storage management products	VAX	VMS 5.0 or later	1M	80.9G	Disk, tape, optical disc, read/write jukeboxes	No	Total data migrated, total new free space created	NP	Volumes	DEC CI bus networks through the HSC	None	$20,000
On-Line Documentation, Inc. **(714) 970-6124** **(800) 743-7520**	CARTS-TM	Space management, performance monitoring, automated data migration, real-time/on-line reporting, volume allocation, budgeting	Part of integrated set, can be used separately	IBM 370 architecture	MVS/SP, MVS/XA, MVS/ESA	2M	6M	Tape	Yes	Customizable	Yes	Individual data sets	None	15% of license fee	$19, 495 for CPU, $34,495 for site
Operations Control Systems **(415) 493-4122**	Spacecontrol	Space management, data compression, disk space utilization reporting, real- time/on-line reporting, automated archiving, budgeting	Data center management products	HP 3000	MPE or MPE-XL	NA	10M	Disk, tape	Yes	Dynamic directory display, archived files, purge history, trend analysis, audit trails, what-if analysis	Yes	Individual data sets, volumes	Any supported for HP3000	Based on configuration	$2,000
	Tape	Real-time/on-line reporting, automated archiving, magnetic tape library management, tape selection	Data center management products	HP 3000	MPE/MP-EXL	NA	NA	Tape	Yes	Tape used, tape needed, off-site tapes	Yes	Individual data sets, volumes	HP/NS 2000, HP/DS3000	Based on configuration	$1,800
Pae, Inc. **(508) 744-8612**	Disk compressor	Space management, data compression, volume allocation, automated archiving	NP	AS/400, System/38	OS/400, CPF	.5M	NP	Tape, disk	Yes	Clients choose what they want	Yes	Individual data sets, volumes	NA	15% of license fee	$500 - $8,850
Professional Software Associates, Inc. **(714) 458-2000**	BAC/Plus	Real-time/on-line reporting, volume allocation, catalog management, automated archiving	None	DEC VAX	VMS	NA	1.5M for software, variable for library/ archive	Disk, tape	Yes	Tape library, tape pools, tape sets, search list, operations log	Yes	Individual data sets, volumes	Decnet	Based on configuration	$1,500 - $6,995
Raxco, Inc. **(301) 258-2620**	Raxmanager, Raxmanager Plus	Performance monitoring, disk space utilization reporting, capacity planning; Raxmanager Plus also includes resource accounting and chargeback billing	None	Any VAX/VMS configuration	VMS Release 5.0 or later	NA	2M	Disk	NP	Time interval, rank and profile	Yes	None	Decnet	$220 - $2,875	$650 - $1,408; $1,050 - $18,500
Rimsco Software, Inc. **(713) 946-0724**	Facilities Administrators Assistance Package	Space management, performance monitoring, data compression, disk space utilization reporting, real- time/on-line reporting, volume allocation, catalog management, automated archiving, automated data migration, budgeting	None	Harris	VOS	1M	10M	Disk, tape	No	Audit trails, usage summaries	Yes	Individual data sets volumes	None	12% of purchase price	$4,500
Saigs Systems, Inc. **(403) 263-1151**	VDM	Space management, disk space utilization reporting	None	VAX	VMS	.15M	.75M	Disk	No	Capacity planning, current usage, file size	Yes	None	None	$95	$695 - $2,995
Software Extraordinaire, Inc. **(305) 451-9204**	Diskman	Space management, disk space utilization reporting, volume allocation, catalog management	None	Wang VS	Wang VS/OS	512K	1M	Disk	No	Management	Yes	None	None	$200	$2,375
	Tapeman	Space management, volume allocation, catalog management	None	Wang VS	Wang VS/OS	512K	Less than 1M	Tape	No	Management operations	Yes	None	None	None	Contact vendor
Software Partners/32, Inc. **(508) 887-6402**	Virtual Storage Manager	Space management, automated data migration, automated archiving	Tape management products	DEC disk device (to be monitored)	VMS 5.0 or later	1M	1.02M	Disk	No	Lists of all files not resident on disk, list of all files not on disk by user name	Yes	Individual data sets, volumes	Decnet	15% of current list price	$3,000 - $21,500
Sterling Software, Inc.'s Systems Software Division **(916) 635-5535**	Storage Automation Management System	Space management, data compression, disk space utilization reporting, real- time/on-line reporting, volume allocation, catalog management, automated archiving, automated data migration, budgeting, PDS management, 3270 GUI, PC-based GUI, idle space release, reporting tools	Yes, this is a set of integrated storage management products	IBM and compatible mainframe/DOS PC	MVS/ESA, MS/PC-DOS for view	1M - 7M	55M	Disk, DASD	Yes	Usage reports, historical reports	Yes	Individual data sets, volumes, catalogs, pools, logical groups	VTAM/TSO	18% of license fee	$64,740
Systems Center, Inc. Unitech Software Division **(705) 264-8000**	Backup Unet	Data compression, automated archiving, backup restore	None	Most Unix platforms	Unix, Berkeley, Socket, interface, supports TCP/IP	2M	15M	Disk, tape, 8mm tape jukebox	Yes	Audit trail	Yes	Individual data sets, volumes	TCP/IP, any LANs	15% of list price	$5,000 - $40,000
	AS/Center	Space management, disk space utilization reporting, real-time/on-line reporting, volume allocation, catalog	Storage and automated operations distributed system management products	AS/400	OS/400	.5M	30M	Disk, tape	Yes	DASD utilization, disaster recovery, cleanup history	Yes	Individual data sets, volumes, libraries	APPN, APPC	NP	NP
Universal Software, Inc. **(203) 792-5100**	ADAS	Space management, disk space utilization reporting, volume allocation	None	IBM mainframes, including 4300, 3000, 9370	DOS/VSE, SP, ESA	20K	200K	Disk	Yes	Data set usage by program, volume display	No	None	None	$1,500	$9,400
W. Quinn Associates **(703) 758-0707**	Q*Reporter	Space management, performance monitoring, disk space utilization reporting, real-time/on-line reporting, volume allocation	Storage management products	Any running VMS	VMS	200K	.5M	Disk, jukebox, optical disc	No	Fragmentation, vic usage, sensitive files, large files, aged files	Yes	None	None	20% of license fee	$522 - $6,762

Cooperative processing phase-in

The technology is not all there, but you can take advantage of some pieces

BY ROBERT MURRAY

Many companies considering a cooperative processing approach are frustrated. They want their authorized personal computer users to get at any and all information they need without worrying about where that data resides, hardware or system boundaries or network characteristics. This capability remains tantalizingly out of reach.

Development for hardware has been slow, as it has been for related standards and systems software. In fact, software lags behind hardware by one to three years.

Most industry insiders agree that it will not be until the turn of the century that cooperative processing, with its enhanced database technologies, graphical user interfaces (GUI) and so on, will be fully deployed. The 1990s are a time of turmoil and change during which organizations must adapt to and adopt these new technologies.

No time for inaction

Companies need not sit idly by waiting for vendors and standards organizations to formulate the "ultimate" tools and techniques for full-fledged cooperative processing environments. The key is for information systems managers to understand the eight phases through which cooperative processing unfolds and to apply what is available today to their environments.

Companies can ready themselves for true cooperative processing by putting the pieces in place with a plan to help introduce these new technologies into the company (see story page 62). Cooperative processing's eight phases are evolutionary, with most software packages currently providing support for the first three phases. In addition, some software vendors have announced support for front-end products that satisfy Phase 4 requirements. Those are the areas in which IS is concentrating its implementation efforts. The remaining phases act as a map showing where the organization should head.

The eight phases of cooperative processing implementation are as follows:

- **Phase 1: Host-based, real-time query and update.** In this phase, host-based data and processing is accessed by dumb terminals to view and update information using predefined transaction processes and edits. Considered state of the art in 1983, this way of processing includes most existing mainframe applications. Many companies still perform a lot of their payroll and administrative tasks with applications designed in this way.

- **Phase 2: Host-based, real-time query and update with additional query available via file transfer to the personal computer.** PC users and companies are rarely content to stay in Phase 1 for long. As they become more PC savvy, users typically want to develop applications using PCs with local spreadsheet and database tools. However, they are hampered by the design capabilities built into host applications, which treat PCs like dumb terminals. Users begin to want more PC access to host-based information.

For their part, organizations want to avoid the significant costs of keying data into a host application as well as keying that same data into one or more PC databases for users. Furthermore, this keying and re-keying introduces errors and inconsistencies into the data. A transaction as simple as an employee address change could lead to a number of update sessions in a number of databases over several months. One organization estimated a simple demographic data change cost more than $400 to process because of this redundant activity.

Ross MacDonald

Enter cooperative processing's second phase. Phase 2 has all the functionality of Phase 1 plus host-based data that can be downloaded to a PC for query and presentation. Organizations design PC downloads into existing applications to facilitate the access to host data by the workstation user. In a payroll system, for example, host applications can be modified to allow specific PC download of host information. A retirement

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Murray is a vice president at Business Information Technology, Inc., a systems integration consulting firm in Concord, Calif.

- **Eight evolutionary phases**
- **Cooperative processing in an ideal world**
- **An implementation plan**

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counselor could download employee benefit profiles from the host for use in a spreadsheet of employee information. It is during this phase that the user gets value from his PC as an information integration tool. Most organizations find themselves in this phase today.

• **Phase 3: Host-based, real-time query and update, with query available via file transfer to a PC and batch updating allowed from PC data.** Users often treat the data in their PC databases as day-to-day "official" information, while the host database is considered a backup good for large batch processes and month-end reporting.

In response to this way of thinking, applications software vendors have designed capabilities for PC uploads and batch updates to the host database. In a payroll application, for example, remote processing of time card data can be accomplished with downloaded data to seed the local database. A procedure for uploading batches of time card information from the PC workstations is written into the host application.

Organizations can build this level of cooperative processing into one or more of their applications at present. Host and desktop devices are used for what they are best at: The host is used as a file or database server, while the PC is used to present and manipulate local quantities of information quickly and efficiently.

It is during this phase that the GUI becomes an increasingly important part of the environment. One study claimed an order of 50% productivity enhancement, 70% fewer errors, 50% overall speed increase and lower frustration levels for the user.

GUIs for the application front end are available now.

It is also at this phase that the definition and scope of requirements for distributed database and networking systems software are clarified within a company. However, keep in mind that true distributed database management systems capabilities for the database back end will not be available until at least 1994 or beyond.

Problems at this phase include data editing and validation. IS must still maintain duplicate sets of edit and validation routines. Maintenance is a problem because IS must ensure that all PCs are using the same software versions.

• **Phase 4: Real-time query and update via either host or PC.** This phase allows the same capabilities as Phase 3 but provides PC data to update the host directly in real time. A variation of this process is available to users of products that provide a GUI front end under OS/2 or Microsoft Corp.'s Windows. With these products, users can cut and paste data from the downloaded screens and/or files and update the host by emulating the dumb terminal sessions of Phase 1.

Many organizations are wrestling with issues related to this phase. The issues seem to boil down to a question of whether to proceed with the implementation of the user interface components of cooperative processing while the systems software continues to evolve or to wait and redesign or redevelop the host applications after all the building blocks are in place.

Several considerations might sway the decision to go the implementation route. Users are demanding higher levels of information integration. They want to pass data among applications using Dynamic Data Exchange as well as Object Linking and Embedment capabilities. Hardware and systems software vendors are involved in a furious battle for control of the desktop. Therefore, host and PC applications software vendors are moving toward higher levels of integration of their applications with the GUI as the showcase.

• **Phase 5: Homogeneous (like databases running the same hardware and systems software platforms) cooperative processing without two-level commit.** This phase is the same as Phase 2, but it has true distributed database capabilities. IBM has said it will announce delivery dates for peer-to-peer distributed databases (that is, between IBM peer systems such as DB2 for MVS, SQL/DS for VSE, SQL/400 for OS/400 and Data Base Manager for OS/2 Extended Edition) in 1991 and beyond.

At this phase, users will have access to the data for which they are authorized. They may manipulate, present and even update that data to meet the changing business environment. They will have the use of sophisticated applications development and query processing tools that will fully utilize the information processing resources of the organization. There will be no more redundant data entry and costly manual reconciliation of errors and inconsistencies.

A number of vendors claim this level of cooperative processing capability. However, there is still too much system overhead required in the application code for their claims to be true. It is wise for IS departments not to commit to a costly database environment conversion until they are satisfied with the state of the art of the vendor's distributed DBMS offerings.

When considering claims of distributed database prowess, IS should look at the financial health of the distributed DBMS provider. The costs to fully implement a distributed DBMS at the system software level will run into millions of dollars over several years. It is important that a distributed DBMS provider have the financial strength to sustain such an investment.

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A way to empower users and increase data availability

Cooperative processing will give users information in the form most suitable for them

If cooperative processing were completely possible right now, what would it entail?

First of all, applications would be written using the client/server architecture. This architecture dictates a logical separation of the presentation (or client) components of the application from the information access (or server) components.

In this way, the user is freed to manipulate the information locally for presentation in any form, such as graphics, text or spreadsheet data. This freedom in presentation enables different users to view and relate to applications in a manner that has the greatest meaning to them.

The relational database management system to which the user is connected would be fully functional as a distributed database to handle information residing at any number of sites on any number and types of computers.

The user interface would be a fully IBM Common User Access-compliant graphical user interface, which would give the user the ability to operate the system without having to remember text commands, parameters or syntax.

The network and operating system software would be prepared to marshal whatever resources are necessary to process the user's requests seamlessly and efficiently.

The application the user is processing would have been developed using computer-aided software engineering tools. As a result, modifying and generating the application would largely be an automated process.

The result of these advances would be that users would have an information outlet via a personal computer to the organization's information resources.

From this information outlet, or desktop window, any authorized user could request information to be extracted, sorted, processed and presented in any form and then return any new or updated information to its proper database.

The cooperative processing network and database servers would find and return the user-requested information wherever it resides. The user's PC or a remote processor can manipulate the information as requested. Other server devices, such as faxes, modems, printers, plotters and so on, may be called on if needed to complete the request.

The cooperative processing systems would automatically monitor use.

ROBERT MURRAY

A plan to implement cooperative processing

Knowing how a cooperative processing environment evolves is a big step toward implementing one. What is also needed, however, is a plan to incorporate the technology within the company. A cooperative processing integration plan calls for the following:

▶**Assess alternatives.** The firm must evaluate the development priorities over a year or two and select target areas for incorporating the new technology. Highly visible projects with limited scope are good candidates. An executive information system with a series of deliverable features is a good example.

▶**Plan for the human impact of change.** How will the new technology affect people in your firm? Understand their needs.

▶**Market change to solicit employee buy-in.** Promote the advantages of the new technology. Provide the employees with a clear picture of how the changes will affect them and why it is good for them and the organization. Avoid at all costs the creation of passive saboteurs.

▶**Provide educational opportunities.** Make employee education a top priority in your plan. Success may hinge on how staff members embrace the changes. Provide them with every opportunity to learn about the new approach.

▶**Provide training.** Offer enough training for all participants. Allow for remedial training opportunities if needed. Provide flexibility in the plan and the schedule to allow reworking of the training program and materials if needed.

▶**Provide useful documentation.** Provide complete documentation in a form and media suitable to the application. Cross-reference the documentation to the training materials and the tasks the user must perform.

▶**Solicit feedback.** Plan time to allow for the project participants and other interested parties to communicate, sharing ideas and concerns. Insist that your project team listen and respond to queries.

▶**Solicit postimplementation feedback.** Collect and publish postimplementation comments. How could the project have gone better? How could the process have gone more smoothly? The answers to these questions are very instructive to your project team members as well as to other technology innovators who will follow.

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UNIX DATABASE

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IDC Study on UNIX OLTP
UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.

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About the TPC
The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

TP1 vs. TPC Benchmarks
The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similiar to a batch test—focuses on database throughput.

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- **Phase 6: Heterogeneous (mixed bag of hardware and systems software) cooperative processing without two-level commit.** This phase expands on Phase 5 in that it adds true distributed database capabilities across hardware platforms. To qualify as a true Phase 6 system, the operating system, networking systems and database systems must handle the security and updates below the level of the application.

Distributed DBMS for heterogeneous systems will be widely available by the middle of the decade. The only major hurdle that will retard full distributed DBMS implementation is replication independence — the ability of the database software to keep track of all replicated copies of data on the network and to update all copies automatically (below the level of the applications software). At Phase 6, this will still be accomplished with a batch update transaction. This batch update will continue to have potential error and inconsistency problems.

True implementation of the replication independence rule will require a two-level commit process before completion of the update action. The database system software must inventory all copies of the data to be updated, lock all the items in question and complete the update to all copies before unlocking the items. If at any point in the update cycle an update fails, the system must back out the update and handle the error condition.

As much as possible, this two-level commit process should be implemented in the database system software below the level of the application. This level of sophisticated communication between heterogeneous systems is not expected to be available before the middle or latter part of this decade.

Despite the shortcomings of systems software, a number of organizations are forging ahead with their cooperative processing implementation plans. To achieve some of the functionality of Phase 7 today, hardy souls are coding into the application the work-arounds needed to bypass the shortcomings of the distributed DBMS and the networking systems software. They are doing so to leap directly to Phase 5 or 6, bypassing Phase 4. Companies must decide if the payoff for applications is high enough to justify the risk.

- **Phase 7: Homogeneous cooperative processing with two-level commit.** This is the same as Phase 5 with true distributed database capabilities. The two-level commit process will enable the data dictionary to locate all redundant copies of the data in all databases and complete the updating of all of that data before committing to the transaction. If the update fails at any site, the entire transaction is backed out so that no inconsistent entries are created.

The promised land of cooperative processing is in sight at this phase. Each application was designed to marshal the information processing resources best suited to the job to satisfy the user's request for action. The capabilities of the desktop PC, the network and the host are all brought to bear on the task. The user has free access (within security constraints) to manipulate information with whatever application tools are desired.

The only remaining restriction at this point is the general availability of these capabilities across all hardware and systems software boundaries. The standards for database and network communications still need to be evolved to allow full implementation of the cooperative processing architecture.

- **Phase 8: Heterogeneous cooperative processing.** This is the same as Phase 5 but with true distributed database capabilities. The standards are not there yet.

Phase 8 ushers in an information processing capability that enables higher levels of information integration. A host of new applications will be needed to take advantage of the competitive opportunities afforded by this technology.

Innovative firms that position themselves now to take advantage of the cooperative processing future will be dominant competitors into the 21st century. •

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NATIONAL BRIEFS

A friend in need

▶ When times get tough, it helps to have friends that count . . . like a bank. Just ask **Western Digital Corp.** Last week, the Irvine, Calif.-based company and its bankers reached an agreement in principle to restructure $206 million of debt. The pact calls for the firm to enter into a two-year collateralized credit agreement that will consolidate some $164 million of outstanding borrowings and extend Western Digital's existing accounts-receivable facility.

Speaking of friends

▶ With his personal computer company well on its way to being a billion-dollar concern, **Dell Computer Corp.** founder, Chairman and Chief Executive Officer **Michael S. Dell** has enlisted the advice of someone who knows the territory: former **Electronic Data Systems Corp.** Vice Chairman and President **Morton H. Myerson.** Earlier this month, Myerson signed on to provide "substantial advisory services" to Dell's executive management.

Golden oldies

▶ **The state of California** got its 1,000th officially registered historical landmark earlier this month: 844 East Charleston Road in Palo Alto, the site on which the late **Robert Noyce** developed the first integrated circuit for Fairchild Semiconductor in 1959. The prestigious designation is the second such for the Silicon Valley, joining the garage in which industry pioneers Bill Hewlett and David Packard started the company that bears their names.

New leader emerges

▶ The **National Science Foundation** (NSF) has named **A. Nico Habermann** to head its Computer and Information Science and Engineering Directorate. The appointment is effective Oct. 1. Habermann has been dean of Carnegie Mellon University's School of Computer Science since 1988. The NSF directorate, which has a budget of $186 million this year, oversees 25 programs in areas such as computers and computation research and information robotics, intelligent systems, advanced scientific computing, microelectronic information processing systems and networking and communications.

Steady Cincom seeks out the spotlight

BY ROSEMARY HAMILTON
CW STAFF

For more than two decades, Cincom Systems, Inc. has been the Steady Eddy of the software industry. Now it wants more.

The Cincinnati-based software company has long operated with a low-risk strategy that may have cost it a big-shot role in the industry, but also prevented it from soaring too high and burning out, as other software companies have done.

Instead of zeroing in on one big money-making product or putting its cash behind marketing and promotion, Cincom quietly worked to build up three key product lines: database and systems software, applications development tools and manufacturing applications.

Cincom, for instance, was one of several mainframe database companies that took on IBM's DB2 in the late 1980s. It was not seen then as a primary competitor, but it was one of the few companies still standing after the battle. Instead of pushing itself as the key IBM rival, it quietly competed on that front while also working on other product areas. This strategy gave Cincom other revenue sources to fall back on when IBM took control of the mainframe database market.

The steady and low-key approach has not wowed the industry. The company has reported modest revenue over the years and just last year passed the $150 million mark. But the company would argue that it has stayed consistent and is now positioned for greater things.

Something new

Today, Cincom is regarding the 1990s as the time to try something new. President Tom Nies, an ex-IBMer who founded the firm in 1968, is charting a course for the software company that he claims will make it an industry leader.

Cincom's Nies: *Eyeing the top spot*

His plan calls for a marketing and promotional push, taking the company public and a reorganization of the sales effort.

"We feel we are in a good position to become the No. 1 provider in each of [our] three major business areas before the decade is out," Nies said.

Industry analysts are not so sure.

"In manufacturing, they are doing interesting things, and they moved from the mainframe marketplace to slots based on value-added services," said Aaron Werman, president of Data Definition, Inc. based in New York. "And they are doing nice work internationally. But they don't have a lever to grab for a major play."

Extra, extra — and the basics, too

That's what Cincom has offered for years, says founder/CEO Tom Nies: Breaking the "best-kept secret" barrier

1968	Cincom Systems, Inc. founded to develop and market systems software.
1969	Cincom's Total is first DBMS delivered by an independent sotware firm.
1970	Cincom is first systems software firm to organize a national users conference.
1973	Cincom opens in Europe.
1974	Cincom moves into distributed software engineering.
1975	Cincom opens in Japan.
1982	Cincom is first software manufacturer to win U.S. Department of Commerce's "E" award for significant contributons in increasing U.S. exports.
1989	Cincom posts its 21st consecutive increase in annual revenue.

CW Chart: Janell Genovese

Nies is predicting that the company, which recorded revenue of $153 million last year, up from $144 million in 1989, will reach the $600 million to $700 million range before the year 2000. The growth, he said, will come from Cincom's three major product lines.

"I would say a qualified yes," said Paul Hessinger, chief technology officer at Softlab, Inc., when asked if Cincom's revenue goal is realistic. "The qualification is that if they can really increase the degree to which they are now meeting customer demands, they then will have a lot of opportunity."

To reach this goal, Nies will rely on at least three major plans, two of which could so expand the company as to risk altering the low-key and solid personality the firm has had for many years (see story page 66).

Promotional push

First, he plans more of a marketing and promotional push, which some industry analysts said is badly needed.

"Cincom has been fairly quiet, and they do have good technology," said Colin White, president of Morgan Hills, Calif.-based Database Associates

Continued on page 66

Teradata adds Castle, eyes global sales move

BY JEAN S. BOZMAN
CW STAFF

EL SEGUNDO, Calif. — With a recent upbeat annual earnings report and signs that a major acquisition is settling in, Teradata Corp. appears to have its act together. Now, to help script its next scenario, the database engine manufacturer also has a new president.

Industry veteran James Castle, 54, took over the Teradata president's post last week. He replaced Kenneth W. Simonds, who remains chairman of the firm. The two plan to share the title and responsibilities of chief executive officer.

Chosen by *Inc.* magazine as one of the fastest growing public companies in the U.S., Teradata is poised to position its relational database offerings as ideal for users eager to move into client/server computing, according to Simonds.

The company makes back-end database "engines" — complete with hardware and software. Its new executive's "extensive business and technical experience . . . will allow us to achieve this goal," Simonds added.

Castle joined Teradata from Infotron Systems Corp., where he served as chairman, president and CEO. Prior to Infotron, he served in executive posts at Thyssen-Bornemisza Group subsidiary TBG Information Systems, Inc. and Memorex Corp.

At Teradata, he will focus on global sales, marketing and manufacturing expansion; the international sector currently accounts for less than 20% of the company's overall sales. Simonds will center on corporate strategy and alliances.

Buoyed by its 1990 merger with Sharebase Corp. in Los Gatos, Calif., 12-year-old Teradata recently posted a fourth-quarter earnings report showing revenue at $82 million, up 26% from $65 million in revenue during last year's comparable period. Year-end results showed Teradata holding relatively steady overall, with $257.8 million in yearly revenue for fiscal 1991, compared with $224.2 million for fiscal 1990.

Costly acquisition

However, the costs of acquiring Sharebase, which have shown up on Teradata's bottom line before, knocked profits down 54% in the year-to-year comparison, from $7 million in last year's fourth quarter to $3.2 million posted for this year's fourth quarter. Simonds said the "up" quarter was a welcome change from the first quarter, which showed a $6 million loss, and the November 1990 layoff of 200 employees, reducing the work force to about 1,400. But cost-cutting measures, coupled with a migration of most high-end Teradata manufacturing to Ireland, appeared to have helped profitability, he said. Sharebase manufacturing still takes place in Los Gatos.

Looking forward, Simonds sees strong demand for the Teradata machines, which sell for $1.5 million or more, among customers in retail, telecommunications and health services. More than 30 deals for Teradata equipment are being signed each quarter, he said. However, demand from East Coast money-center banks and financial institutions is down, he noted.

While Teradata appears not to have been touched by the recession that has pushed other database firms' earnings down, fourth-quarter revenue could be a "bubble" of pent-up demand for products, analysts warned.

Cincom seeks

CONTINUED FROM PAGE 65

International.

"Where they've suffered is in their ability to market it. My experience is [that] the products that are the best technically aren't necessarily the ones that sell. Some companies are technology-driven, like Cincom. Some are marketing-driven, like Oracle. The challenge here is to get the right mixture," White added.

Going public

However, Nies' two other plans will be even more challenging. He still intends to take the company public sometime this decade. Until now, the company has looked to asset sales as one way to pump up its revenue base. This strategy recently yielded the company $50 million, when the firm sold Net/Master, its network management software, to Systems Center, Inc. The sale was just recently concluded: Cincom received its last installment of $6.3 million earlier this month.

Now Nies is inching closer to a long-term goal of going public for a future cash infusion. He confirmed it is still a goal for the 1990s.

"The objective of becoming a public company is part and parcel of becoming a larger company," he said.

Hessinger said that this move could perhaps become Nies' "crowning achievement" if approached later in the decade. However, he added, "There is no way anyone would even try to take them public right now. The climate just isn't right."

The remaining plan calls for a restructuring of Cincom's sales efforts that will eventually shift the focus from direct sales to a heavy reliance on indirect distribution channels. The goal will be to push higher volumes of less expensive software for smaller platforms. "Today, about 85% is from direct [sales]," Nies said. "I expect that to be under half by the end of the decade."

The revenue goal, he said, will be met not only through these future changes, but as a result of the foundation the company has already laid. Cincom's years out of the spotlight, Nies said, have been to the firm's advantage: Instead of spending money on promotion, Cincom pumped it into research and development and sales.

Even spread

Long before the DB2 war, Cincom was moving into new markets and weaning itself from dependency on mainframe database sales. As a result, the company's business is now spread evenly across three major areas. One-third of its business now comes from its manufacturing software line and another third comes from the applications development tools business.

In addition, the company has been setting up international operations since shortly after Nies founded it. Currently, more than 70% of its revenue comes from overseas sales, which Nies cited as a strength.

Finally, Cincom has been pushing into new operating environments, which again lessens its need for IBM mainframe business. The company offers products on Digital Equipment Corp. Unix and personal computer platforms.

Nies said these efforts put Cincom in a stronger position than either competitors who have grown quickly through acquisitions or those that have focused on narrower product areas.

Culture could change

Cincom Systems is known as a straight-shooting kind of company. Privately held, the firm has long opted for a low-key approach. There is no razzle-dazzle in Cincinnati. At worst, it could be considered boring.

Tom Nies, who left IBM in the late 1960s to start Cincom, takes pride in that corporate culture and has fostered a solid work ethic and traditional values among employees.

"I notice all the time that people from Cincom don't seem to leave the company," said Shaku Atre, president of Atre/Intec, Inc. "So, this Tom Nies must be doing something right."

Now, Nies could see that personality changed as he gambles to make Cincom a major industry player.

"Exposing their entire operation in a public manner would be a major cultural change for them," said Paul Hessinger, chief technology officer at Softlab, Inc.

Nies, however, is convinced that he can move Cincom beyond the $500 million mark and keep its corporate culture intact.

When a mature company goes public, Nies said, it can offer as little as 10% of the company to investors, whereas a start-up may have to put a majority of shares on the block. With this strategy, he is expecting that "the control of the business won't be snatched away from us.

"We can say, 'You don't have to buy our promises. You won't have control, and you can't move us away from what we're doing. If you don't want to make this investment, go somewhere else.' "

ROSEMARY HAMILTON

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3Com's Benhamou breaks free from OS/2 battle fatigue

3Com Corp. Chief Executive Officer Eric Benhamou, with his firm some six months out of the network operating systems business, talks like a man who has had a tremendous weight lifted from his shoulders. When he says he doesn't really care what happens to OS/2 — and that he is just happy he doesn't have to worry about who wins the Netware/LAN Manager battle — he seems to mean it.

This lack of worry is not a complete surprise, however. Benhamou came to 3Com with its purchase of Bridge Communications Corp., a gateway vendor whose core business has come to be the focus of 3Com's efforts.

Last month, Benhamou spoke with Computerworld Hong Kong *reporter Don Tennant about what he calls 3Com's "reorientation" and about his game plan as a "neutral" player in a network operating system match that pits former teammate Microsoft Corp. against former adversary Novell, Inc.*

Where do you now view 3Com in industry?
The information systems industry has two major poles of attraction: a computing pole and a networking pole. The firms that we hear about are somewhere in between — most actually much closer to computing. What we want to focus on is networking.

What did you recently announce?
We announced our intention to pursue this [networking] business and therefore, to de-emphasize and, over time, to get out of our work-group computing business — which includes a new relationship with Microsoft where we actually transferred to them full responsibility for LAN Manager.

Benhamou *addresses 3Com's network reorientation*

We also announced our intention to de-emphasize our work-group systems business, which includes workstations and server platforms. And we announced a [$67 million] restructuring charge to finance these activities.

Would it be fair to say the 3Com/Microsoft/Novell triangle has changed — that in the past, it was 3Com and Microsoft vs. Novell, and now it's 3Com and Novell vs. Microsoft?
There is a fundamental change, but it's not that one. The change is that now, we have become network operating system-independent. Novell and Microsoft will continue to fight for preeminence in network operating systems. But in all the things we do from this point forward in the field of global data networking, we are neutral.

Was the questionable future of OS/2 a factor in 3Com's decision?
It was a secondary factor, not the most essential one. It turns out that from the beginning, 3+Open was associated in people's minds with OS/2 very closely — even though you could purchase a 3+Open operating system and not transform your desktops into OS/2 machines.

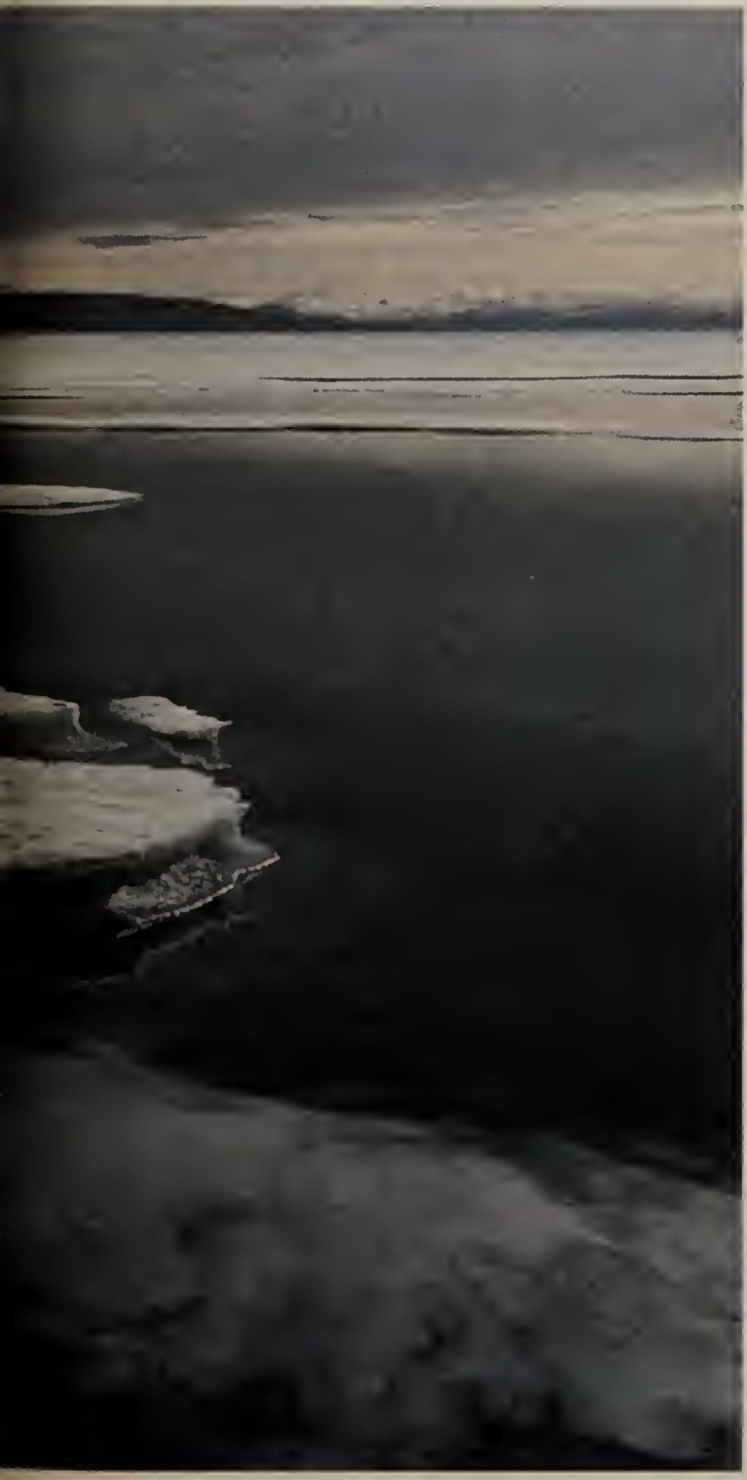
You are quoted in previous press reports as saying that marketing 3+Open was "too much of an uphill battle." Was that because of the OS/2 link?
Yes, very much so.

You say you are neutral, but it seems that 3Com is drifting more toward Novell and away from Microsoft. Is that not the case?
It is, but only because we think we have a better business opportunity there. We aren't trying to push people to buy Novell. But it turns out Novell has a much bigger market share.

Because of the $67 million restructuring charge, you reported a net loss of $27.7 million for the year ended May 31. What is your cash position now?
We have a very strong cash balance — $100 million. And we have no debts, short-term or long-term. We will be using some of this cash to make investments this year: one major investment in Europe and one in Japan. In Europe, we are investing in a new manufacturing plant in Ireland. Initially, we will be manufacturing adapters, but eventually our entire product line for the European markets.

The other major investment we're making is in Japan. This is more of a marketing/sales/service/support joint venture. We'll also be developing some products for the Japanese market — a much stronger presence in that market than we've had in the past.

[Note: Shortly after this interview, 3Com announced 3Com Kabushiki Kaisha, a joint venture with Japanese networking entrepreneur Seiji Uehara to form a firm aimed at providing connectivity products and services to the Japanese market].



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Closing in

▶ **AT&T** announced earlier this month that it aims to see international activities — currently the source of some 15% of overall revenue — close in on producing 50% of the communication giant's bottom line by the end of the decade. AT&T said major opportunities for growth beyond domestic borders exist in Spain and Italy, with less developed regions — for instance, Eastern Europe, where AT&T recently signed a $100 million contract in Poland — rich in potential.

Taking off

▶ Pilot production of the first run of semiconductors from the joint venture manufacturing created by Taiwan-based **Acer, Inc.** and Dallas-based **Texas Instruments, Inc.** kicked off early this month in Hsin-Chu, Taiwan. The plant, expected to go into mass production of dynamic random-access memory chips within six months, plans to produce up to 1 million chips a month.

D day

▶ Sept. 12 could be D day for **Norsk Data**, Norway's financially beleaguered former minicomputer maker. A recent report in the Norwegian business press said the firm will announce financial results for its first half that day, and early indications are that it will post a loss in excess of $15 million. The past year has seen Norsk Data lose critical public contracts worth some $149 million, the report said.

No dumping

▶ Following recent penalties on flat-panel displays, the **U.S. International Trade Commission** last week placed extra tariffs on Japanese personal word processors, which it deemed were being dumped on the U.S. market. The U.S. group slapped an extra 58.17% duty on the small products, which four commissioners reviewing the case agreed had been sold in the U.S. for less than their production costs.

COURT REPORT

Costa Mesa, Calif.-based **Emulex Corp.** last week became the fourth firm in the past eight weeks to find itself on the defendant end of a patent infringement lawsuit filed by **Digital Equipment Corp.**

As it roared down the warpath against those allegedly appropriating its patented disk and tape controller technology, however, DEC offered a courtroom bypass route.

Earlier this month, a pair of third-party vendors were the first to capitulate to DEC's demand for a voluntary phaseout of products DEC claims infringe on the technology at issue.

The two disk and tape drive vendors — **Winchester Systems, Inc.** in Woburn, Mass., and **Aviv Corp.** in Burlington, Mass. — will shift to "noninfringing" products by December 1992. They will be able to sell their current line until then, company officials said.

In short order, a new wave of firms agreed to voluntarily phase out competitive products that allegedly step on DEC's protected turf. Three of the companies asked DEC to keep their names secret, but the others who signed the phaseout agreement are **American Digital Systems, Inc.**, **Exsys Storage Systems, Inc.** and **Transitional Technology, Inc.**

DEC announced the phaseout program June 18 along with its patent infringement lawsuit against **Micro Technology, Inc.** (MTI) in Anaheim, Calif.; MTI slapped DEC with a countersuit last week. On July 9, DEC filed a second suit against MTI's German subsidiary, **Micro Technology GmbH** in Hamburg, Germany. Los Gatos, Calif.-based **Lago Systems, Inc.** joined the list of defendants on July 31.

"We have repeatedly stated that we are serious about protecting our intellectual property rights," DEC Vice President Charles F. Christ said last week. The creation of the phaseout program, he said, is a clear signal that DEC would prefer infringers to phase out voluntarily. "When companies such as Emulex refuse to do so," Christ said, "it is with the understanding that we will go to court."

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Global information officers entering IS picture

BY ALICE LAPLANTE
SPECIAL TO CW

When Unum Life Insurance Co. in Portland, Maine, acquired a British insurance firm last year, senior information systems managers were challenged to develop a new set of skills: building a technically progressive IS operation that works in harmony with U.S. standards yet fits the needs of the foreign subsidiary. The company's answer: a decentralized "team" management style.

As more U.S. corporations grow international in scope, top IS executives are beginning to broaden their backgrounds to master a dramatically different systems scenario. What this means is that senior IS managers are finding that they must take a more team-oriented, cooperative approach to solve complex technological and organizational issues.

The difficulties of this transition are documented in a paper by Jerry Kanter and Richard M. Kesner of Babson College in Wellesley, Mass. Titled "The CIO/GIO as Catalyst and Facilitator: Building the Information Utility to Meet Global Challenges," it examines the issues facing the global information officer.

Companies unable to optimize their IS resources on a global scale will find themselves at a significant competitive disadvantage, according to Kanter, executive director of the Center for Information Management Studies at Babson.

Some of the problems that skilled global information officers are expected to address are the following:

- Duplication of high-cost systems development efforts at multiple sites.
- Implementation of systems incapable of connecting to each other or to the main data center without hassle and expense.
- Inability of IS to serve the strategic business needs of a worldwide organization in a timely manner.

Because of the newness of the global information officer role, these professionals face managerial and organizational challenges: They must balance the need for some sort of global IS game plan with a decentralized and flexible management style, Kanter says. As a result, most U.S. multinational firms have given foreign IS subsidiaries a wide degree of autonomy in making key technology decisions.

This is the case at Merrill Lynch & Co. in New York, says Howard P. Sorgen, first vice president and director of information technology. Utility functions such as telecommunications, data centers and centralized applications development activities are done out of central IS in New York, which also sets standards for appropriate hardware and software to be used by Merrill Lynch offices worldwide. Everything else is left up to the individual site.

"We provide our overseas locations with an appropriate degree of entrepreneurial freedom," Sorgen says. "They are much more closely attuned to the local market and can therefore ensure that a technological solution fits the business needs of that particular site."

Technical obstacles are also something global information officers will have to face in the global IS world.

Telecommunications is particularly critical: With the quantity and quality of vendors and services varying so widely from one country to another, it can be difficult to put a worldwide telecommunications network in place. In addition, global information officers can't assume that technologies available here will be available overseas, says Sheldon Laube, the national director of information technology at Price Waterhouse in New York.

"Things we take for granted, like quality phone service, can be extraordinarily difficult to get in South America and some parts of Europe," Laube says. Basic hardware and software can be difficult to purchase in certain countries, he adds. "You can standardize on systems here that are well beyond what the technology and infrastructure of other countries can support."

Emerging communications technologies such as videoconferencing help the global information officer keep in touch with and manage a diverse scattering of international IS groups. Most U.S. multinationals are putting sophisticated videoconferencing systems in place and make extensive use of electronic mail and voice mail to communicate across geographic and time barriers.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Stepping-stones

The following six components are essential if a senior IS executive is to successfully move into the global arena, say Jerry Kanter and Richard M. Kesner, authors of a working paper on the global information officer published by Babson College:

- A team-oriented approach to management that rules through consensus, with a sensitivity to the diverse peoples and cultures that make up a global IS organization.
- An appropriate IS structure that balances centralized architecture and standards policy with autonomous local activity. Heading this IS structure, the global information officer should report to the senior executive officer of the corporation and sit as a peer on the executive council and participate fully in strategic business decisions.
- A firm grasp of existing computer and telecommunications technologies as well as a vision of how emerging technologies can benefit the business.
- A commitment to total quality management, which focuses on excellence in both individual and team performance.
- A willingness to turn to resources outside IS for guidance and support on critical decisions.
- A desire to become an agent of change for human resources as well as technological concerns within the organization.

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MANAGING YOUR CAREER

Jack Erdlen

Rewards of tooting your own horn

Years ago, a musical entitled "How to Succeed in Business Without Really Trying" hit Broadway. It told the story of an engaging young man who began his career in an entry-level position. Using cunning and guile, he managed to climb his way to the top.

Most people would tend to regard this tale as something that could never happen in real life. However, like all fables, an important message lies within: "You can influence your own destiny."

This message is true for any professional — even one in information systems. The best way for IS professionals to receive accolades and promotions that can influence their destinies is to become their own public relations agents — both inside and outside of their companies.

Because IS specialists interact with departments throughout the organization, many opportunities for corporate visibility are at their fingertips. Here's how they can begin their internal PR campaign:

- Obtain a mentor who can explain the corporate culture and identify the various factors that contribute to success in that environment.
- Expand knowledge and skills by taking company courses and seminars that will improve and increase their competencies in those areas that management considers to be important.
- Volunteer for assignments that will demonstrate to their bosses that they are team players who are willing to go the extra yard.
- Train staff members so they are qualified for any promotional situations that may develop. This will demonstrate management skills.
- Keep records of accomplishments and assignments while noting any positive responses (awards, citations, acknowledgements).
- Develop a plan to accomplish the goals that are outlined in the annual performance review.
- Participate in company activities outside of their work assignments that will enable them to develop relationships and obtain recognition outside of the IS department.
- Interface with the human resources personnel to become more aware of attractive positions that may develop within the company.
- Associate with successful people in the corporation whenever possible in order to benefit from their suggestions and advice.
- Attend all staff meetings and contribute to discussions when appropriate.
- Meet all deadline dates for assignments with time to spare so that they will earn reputations as reliable performers.
- Keep lines of communication open.
- Develop listening skills so that peers and subordinates will consider them approachable.
- Dress and groom for success.

But even if IS professionals make commendable internal progress, they will also need to get noticed outside the company. Professionals can view this step in the PR process as an insurance policy if they decide to move on to another company. But at the same time, they will be expanding their horizons and acquiring access to expertise that should enable them to do their jobs even better.

This part of the self-promotional process requires the expansion of technical knowledge, improvement of communications skills, development of contacts and establishment of a reputation. IS professionals can take the following approaches:

- Enroll in an advanced degree program and/or courses and seminars related to the IS world.
- Subscribe to professional publications that will keep them informed on current topics and emerging issues.
- Join local and national associations that are dedicated to their areas of work interest.
- Participate actively on committees of various professional and social organizations.
- Write business articles for publications that are held in high regard by contemporaries.
- Develop relationships with academic personnel who are rated as outstanding in their particular field.
- Address business conferences or meetings as a panelist or featured speaker.
- Try to get noteworthy activities and achievements reported in the public and business news media.
- Become acquainted with IS consultants whose style and track record have been successful.
- Provide referrals to executive search firms and placement organizations that seek assistance in filling positions.
- Serve as mentor or counselor to other professionals who seek suggestions and advice.

"How to Succeed in Business Without Really Trying" is really a paradoxical title. Promoting your career takes hard work and a considerable amount of self-sacrifice, but the rewards are worth the effort.

It has always been my contention that career success translates into being good at what you do and making certain that other people are aware of your abilities. To accomplish this objective, IS professionals must become their own PR agents to some degree. Otherwise, the chances are quite high that they will encounter disappointments and possibly be an unemployment statistic at some time during their careers.

Erdlen is president of The Erdlen Bogard Group, Inc., a human resources firm that specializes in outplacement and consulting programs.

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COMPUTER PROGRAMMER/ANALYST II to design, develop, program, analyze and maintain complex automated systems for vocational education batch and on-line application on IBM Mainframe and PC using COBOL, JCL, CICS, SPSS, TSO, DIOSS and VSAM languages, and access methods and Novell networks. Require: B.S. in Computer & Information Sciences with one year's experience (M.S. in Computer & Information Sciences with demonstrable ability to perform stated duties may be substituted for B.S. and one year's experience). Salary: $2,100/month. M-F, 8:00a.m. to 5:00p.m. Apply with resume to: Job Service of Florida, 1307 North Monroe Street, Tallahassee, FL 32303. Job No. FL-0479019.

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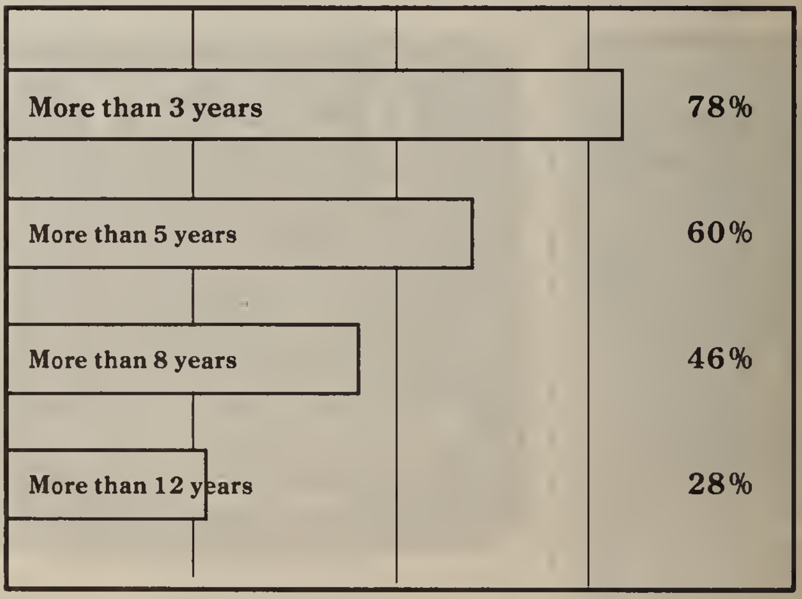

Source: Skill Survey of Computerworld's Audience, May 1989.

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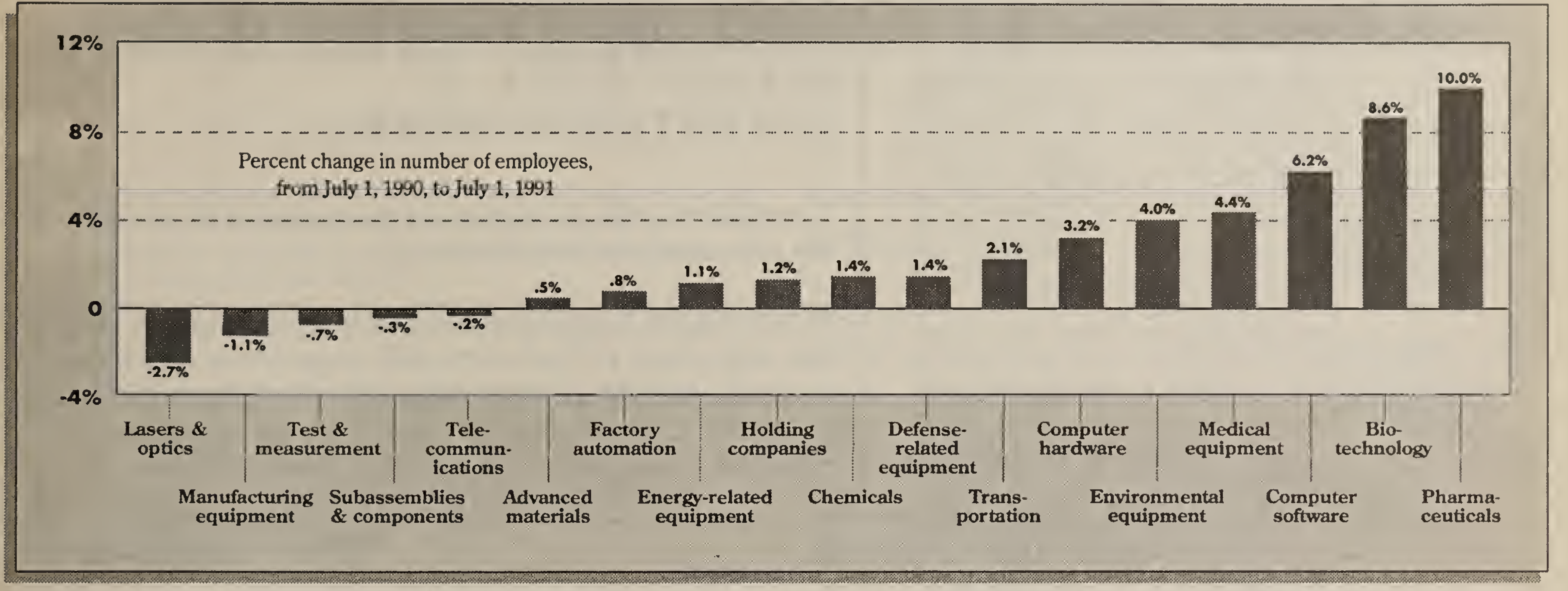
Computerworld/Corptech Career Index

PHARMACEUTICAL AND BIOTECHNOLOGY COMPANIES — Employment growth in small and medium-size pharmaceutical and biotechnology manufacturing firms is outpacing growth in other high-tech categories, based on a survey of 6,127 technology manufacturers



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TPF SYSTEMS ANALYST required. Design and develop new ACP/TPF systems in a Real Time environment using Assembler. Design of system functionality, coding, testing, and implementation of new systems software. Ensure that systems standards are maintained according to the principles of an ACP/TPF environment. Utilize TPFDF, C370 and SPM's to provide design structure, perform system maintenance and maintain system integrity. Applicants required to have e Bachelors Degree or its equivalent in Computers, Math or Engineering with at least two years ACP/TPF Programming and Assembler Coding experience. Experience must include at least one year with TPFDF, SPM's and C370 programming and analysis. Annual salary will be $46,000.00 per year for e 40 hour work week. Additional salary up to $56,000.00 may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J. 0. number 6421820. This advertisement paid by an Equal Opportunity Employment Employer.

SYSTEMS ANALYST - 40 hrs. / wk. 8-5. $40,000.00 per yr. Design, develop and Implement Financial and Accounting software application systems utilizing IBM 3090, 4341, 4381, PCAT and DG-C380 mainframes; CICS/VS, VSAM, DB2/SQL, APS, INGRES software; COBOLII, DG-COBOL languages; MVS, MS-DOS, DOS/VSE and AOS operating systems. Requires Bachelors degree in Computer Science or Statistics, will eccept 4 years of experience as Software Engineer or Systems Analyst in lieu of Bechelors degree; 2 years experience in job offered or 2 years experience es Software Engineer; experience must include one year with IBM 3090, 4341, 4381, DG-C380, PCAT mainframes; CICS/VS, VSAM, DB2/SQL, APS, INGRES software; COBOLII, DG-COBOL languages. "Employer Paid Ad." Send resumes to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Reference No. 56591.

Systems Analyst, 40 hrs/wk. 9:00am - 5:00pm, $30,000/yr. Design, modification, implementation and testing of software for the full range of accounting applications. Duties include database management and customization of SBT database accounting library system. Tools: dbman; Foxbase; Clipper; Dbase III; Novell Network. Bachelor's degree in Computer Science as well es 2 years experience es a Systems Analyst or as e Programmer required. Previous experience must include software design for accounting applications using COBOL and dBase III. Must have proof of legal authority to work permanently in the U.S. Send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Ms. M. McKenzie, Reference #V-IL-3365-K, NO CALLS, AN EMPLOYER PAID AD.

Eight or more TPF SOFTWARE ENGINEERS required. Design and develop new ACP/TPF applications in e Real Time environment using Assembler. Design of system functionality, coding, testing, and Implementation of new software. Ensure thet software and system stenderds ere maintained eccording to the principles of en ACP/TPF environment. Utilize TPFDF, C370 end IEF applications CASE tools to provide design structure, perform system maintenance end maintain system integrity. Applicants required to heve a Bechelors Degree or its equivalent in Computers, Meth or Engineering with at leest two yeers ACP/TPF Programming end Assembler Coding experience. Experience must include et least one year with TPFDF and C370 programming end enalysis end six months experience or training with IEF. Annual salary will be $46,000.00 per yeer for e 40 hour work week. Additionel salery up to $56,000.00 mey be paid if education and experience warrant. Interested applicants epply at the Texes Employment Commission, Fort Worth, Texes, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J. 0. number 6421821. This edvertisement paid by an Equal Opportunity Employment Employer.

Programmer/Analyst, 40 hrs/wk. 9:00am - 5:00pm, $31,000/yr. Design/implementation of transportation software with micro to host capability running in e multi-user environment. Analysis/programming of e linear routing algorithm depending on complex concurrent processing techniques such as interprocess communications. Maintain internal geogrephic network file. Provide hotline support and technical solutions to clients. Tools: Pescal, C, Assembler, RS232c serial interface, SDLC protocol, IDEAcomm 5251/plus, IDEA TWINAX emulator, XENIX System V, micro and mainframe computer. M.S. in Computer Science as well as 1 year experience as e Programmer Analyst or es a Programmer. Graduete education must include: Telecommunications Systems, Analysis of Algorithms, Advanced Database Orgenizations and Concurrent Programming as well as one project on the design of algorithms to enhance performance. Must have proof of legal authority to work permanently in the U.S. Send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Joan Sykstus, Reference #V-IL-3185-S, NO CALLS, AN EMPLOYER PAID AD.

SENIOR SOFTWARE ENGINEER - 40 hrs./wk. 8-5. $48,000.00 per yr. Analyze, design and develop Transportation software application systems utilizing IBM 3090, B7900, A15, VAX 11/750 and IBM PC AT's; DB2, CICS, DMS-II, ORACLE, AIM, SDG, COMS, SQL, Detabase Manager Software; COBOL, 'C' and FORTRAN languages; MVS, OS/2 and MCP operating systems. Requires Bachelors degree in Computer Science, Electrical or Mechanical Engineering, 2 years experience in job offered or 2 years experience as Systems Analyst; two years experience with CAD/CAM and Inventory Control Systems. "Employer Paid Ad." Send resumes to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Reference NO. 58591.

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Systems Engineer

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Education Required: Completion of nonthesis course work required for Master of Computer Science degree. Academic course work must include 3 credit hours in each of the following: Distributed Systems, Computer Graphics, Database Management Systems, Advanced Software Development and Advanced Software Systems. Course content for Advanced Software Development and Advanced Software Systems should include systems life cycle, debugging techniques and tools and project management.

The minimum working hours are 40 hours per week, with a starting salary of $32,040 per year. This ad is employer paid. Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 50691.

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Development Software Engineer responsible for specification, prototyping & implementation of a number of key features including support for extensions in X window server & developing interfaces to TCP/IP network protocol as well as developing documentation, including specifications, & porting of software from a number of different software environments. The software development environment is sophisticated involving the use of advanced operating systems, VMS, UNIX & Computer Aided Software Engineering (CASE) tools. The primary implementation language is C. Requirements for this position are: a Master of Science degree in Computer Engineering or Computer Science with a background in network theory, advanced operating systems, VMS, UNIX, C programming language, and CASE tools. Salary: $33,300.00 per year. 40hr/wk. 8:15am-5pm. No exp. req. If you are interested in, & qualified for the above position, please forward (2) resumes to: Job Order #1799, Massachusetts Department of Employment & Training, Special Programs Unit, Charles F. Hurley Building, 19 Staniford Street, Government Center, Boston, MA 02114. EOE.

CUSTOMER SERVICE SOFTWARE ENGINEER

ENGINEER, CUSTOMER SERVICE: Solve problems re object-oriented database software; design applications and benchmarks; pre-sales support and related, incl. customer education; develop/improve procedures, databases, forms, and reports; liaise with Mktg. & Eng'g. Depts. Job requires: MSCS/Eng'g., or BS + 2 yrs. relevant exp. Also need: knowledge of C and C++; famil. w/object database "Gemstone"; bkgd. in design and implementation of object-oriented software; knowledge of UNIX, VMS, MS-DOS, and Macintosh operating systems and development environments; famil. with computer networking, incl. DECnet & NFS; tech. understanding of data mgmt. systems; bkgd. in object-oriented technology; knowledge of mfg. CAD/CIM and mech. eng'g. Full-time. Salary: $39,000/yr. Job site and interviews: Beeverton, OR. Send resume to: Employment Division, ATTN; Job Order #5550160; 875 Union St. N.E., Rm. 201, Salem, OR 97311.

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Programmer-Analyst; 40 hrs./wk.; 8 am-5 pm; $36,000/yr. Job requires: Master's degree in Computer Science and 1 yr. experience as a Programmer-Analyst or Systems Analyst. Job also reqs.: 1) Exp. must include exp. using Hewlett-Packard computer system or successful completion of a course using Hewlett-Packard computer system; 2) Exp. must include exp. using database management system or successful completion of a course using database management system; 3) Exp. must include exp. using FORTRAN programming language or successful completion of a course using FORTRAN computer language; & 4) Exp. must include exp. using DEC VAX computer or successful completion of a course using DEC VAX computer. Special reqs. 1), 2), 3), & 4) may be met concurrently in the same year of exp. or courses. Job duties: Develop software systems on Hewlett-Packard (HP) computer. Support, enhance, & maintain software systems on HP & Digital Equipment Corporation (DEC) VAX computers. Support & maintain the electronic data interchange (EDI) system which communicates with eutomotive manufacturers, on both the HP & DEC hardware platforms. Qualified applicants should send resume & verification of reqs. to: 7310 Woodward, Rm. 415, Detroit, MI 48202. Ref. #57091. Employer paid ad.

PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming anelysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and programs design, coding and testing enhancements. Develop, write code and implement new application programs to meet current and projected client needs. Duties entail work with PS/2, OS/2, C, ASSEMBLY, ICE Progremming, Device Driver Programming and Interprocess Communications. Must have Master's in Computer Science or Engineering or Math. Experience required is six months in job offered or six months as a Systems Analyst or Software Engineer. Additionally, experience must involve use of PS/2, OS/2, C, ASSEMBLY, ICE Programming, Device Driver Programming and Interprocess Communications. M-F; 40 hrs/week. 8:00-5:00; salary $38,000/year; Boca Reton, Florida location. Must have proof of legal authority to work in the U.S. Send resume to Job Service of Florida, 105 E. Broward Blvd., Fort Lauderdale, Florida 33301, Attn: J.O. #FL 0473746. EOE.

SENIOR SOFTWARE ENGINEER - 40 hrs./wk. 8-5. $47,000.00 per yr. Analyze, design, develop and meintein an on-line fault tolerant problem reporting software system utilizing Tandem-Cyclone, VLX, CLX, Liberty (Risc) hardware; INFOVIEW, TBASECI, VIEWPOINT, MEASURE, ENSCRIBE, FVP, DBACCESS, DSAP Software; Tandem-C, TEXTBASE, SEEVIEW, TAL, TACL languages; Geurdian C-20 and C-30 operating systems. Supervise analyst/programmers in software development. Requires Bachelors degree in Computer Science, Electrical Engineering or Menagement, 1 year experience in job offered or 1 year experience as Systems Analyst or Assistant Systems Analyst; six months experience with TMF, Enscribe, DDL and EXEC Software. "Employer Paid Ad." Send resumes to: 7310 Woodward Ave., Room 415, Detroit, MI 48202. Reference NO. 58491.

Three or more REAL TIME PROGRAMMER ANALYSTS required. Design and develop new software applications in a Real Time environment using Assembler and "C". Design of system functionality, coding, testing, and implementation of new software. Ensure that software and system standards are maintained according to the principles of e Real-Time environment. Utilize ACP/TPF, C/370 and IEF applications CASE tools to provide design structure, perform system maintenance and maintain system integrity. Applicants required to have an Associates Degree or its equivalent in any analytical science with at least two years ACP/TPF Programming and Assembler coding. Experience must include at least six months with C/370 programming and analysis and six months experience with IEF. Annual salary will be $42,000.00 per year for e 40 hour work week. Additional salary up to $52,000.00 may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Austin, TX 78778-0001, J. 0. Number 6421822. This advertisement paid by an Equal Opportunity Employment Employer.

Systems Analyst, 40 hrs/wk. 9:00am - 5:00pm, $33,000/yr. Design, develop, implement and test software systems to be utilized in stock exchange analysis. Projects include: trade support system for listed securities; rule-based expert system for matching trades; networking. Tools: C/UNIX; Sun workstetion; AIX; TCP/IP. M.S. in Computer Science as well as 6 months experience as a Systems Analyst or as a Research Assistant required. Previous experience must include development of rule-based expert systems. Graduate education must include one course each in Computer Communication Networks, Information Storage Retrieval and Compiler Construction as well as one project using TCP/IP in C with UNIX or AIX. Must have proof of legal authority to work permanently in the U.S. Send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attn: Joan Sykstus, Reference #V-IL 3705-S, **NO CALLS,** AN EMPLOYER PAID AD.

Software Engineer, 40hrs/wk. 9:00am - 5:00 pm, $55,000/yr. Design, develop, implement and test a wide range of management support system/internal control systems to include networking and database applications. Tools: UNIX/C, Informix SQL and 4GL. B.S. in Mathematics or Computer Science as well as 5 years experience as a Software Engineer or as a Systems Analyst required. Previous experience must include project management and consulting. One additional year experience in UNIX/C, Informix SQL and 4GL, real time processing. Must have proof of legal authority to work permanently in the U.S. Send resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: D. Rule, Reference #V-IL-3013-R, **NO CALLS,** AN EMPLOYER PAID AD.

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Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. From manufacturing to banking, healthcare to insurance, Computerworld reaches the right people in every major industry.

Industry	Computerworld's Audience
Computer Vendor and Consulting	152,534
Computer Manufacturer	81,998
large-scale computers	38,160
medium-scale computers	47,528
small-scale computers	35,316
personal computers	49,128
technical workstations	25,526
Software Vendor	134,207
for large-scale systems	59,196
for medium-scale systems	77,372
for small-scale systems	63,545
for personal computers	78,973
for technical workstations	27,005
Non-CPU Computer Products Manufacturer	38,024
VAR/Dealer/Retailer	28,652
DP Service Bureau/ Contract DP Services	55,093
Consulting/Planning	89,851
Manufacturer (not computers)	174,028
Insurance	54,721
Healthcare	66,086
Banking/Financial Services	101,111
Government Federal/State/Local	112,768
Business Service (except DP)	41,407
Communications Systems	29,709
Public Utilities	55,627
Transportation	26,598
Wholesale/Retail Trade	113,584
Education	127,431

SOURCE: Skill Survey of **Computerworld's** Audience, May 1989.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/ 343-6474 (in MA, 508/879-0700).**

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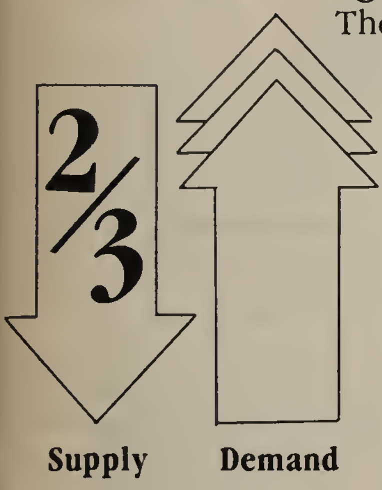
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

For every 10 of today's computer job seekers . . .
2 are Active ▢▢
7 are Passive ▢▢▢▢▢▢▢
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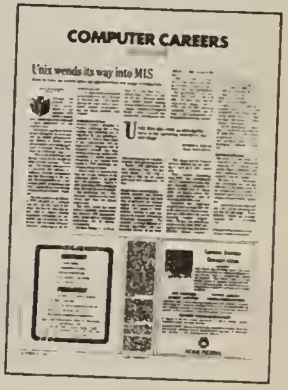

Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

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How you can keep pirated software from coming on board at your firm

Legal Eye is a monthly column exploring legal issues and their impact on information systems.

BY MARY J. HILDEBRAND
SPECIAL TO CW

One year after acquiring software designed to handle its market expansion, Smith, Inc., a plumbing manufacturer in Newark, N.J., was served with a court order that directed it to immediately cease and desist from using the software.

The reason? Smith's vendor never owned the software and had no authority to grant the company a license.

Let the information systems buyer beware: In most software licensing transactions, only the vendor knows the origin of its product and the source of any potential clouds on the title. As a result, the buyer must introduce the issue of product ownership prior to closing the transaction.

Contract protection

The best way for an IS buyer to protect his company from licensing pirated software is through a contract. Buyers should request that the following warranties be included in the contract:

- Vendor warrants that it owns and possesses all rights and interest in the software necessary to grant a license to the buyer.
- Vendor warrants that the software shall not violate or infringe on any contractual, trade secret, proprietary information and nondisclosure rights or any intellectual property rights.

In the first contract provision, the vendor represents that it has all rights necessary to enter into the agreement and grant a license for the product. The vendor may be an exclusive owner of the product, a distributor or reseller. The key is accountability: The vendor is responsible for ensuring the accuracy of these representations, or it will confront serious legal consequences.

The second provision helps protect the buyer from claims of ownership to the software by the independent consultants who participated in the development of the product. The vendor also promises that its product does not interfere with intellectual property owned by others.

However, simply including warranties in the contract is not enough. IS buyers must make sure the contract states that the vendor will assume full responsibility for any losses or damages incurred by the buyer if these warranties prove to be false. Here are some examples of appropriate wording.

- Vendor shall indemnify and hold buyer, its agents and employees harmless from any loss, damage or liability including reasonable attorneys' fees arising from either breach of any warranties set forth herein or infringement of any patent right, copyright, trademark or other intellectual property right with respect to the software.
- Vendor further warrants that if the buyer is precluded from using the software because of an actual or claimed infringement of any patent right, copyright, trademark or other intellectual property right, or for any other reason, then, at buyer's option and vendor's expense, vendor shall procure for buyer the right to continue to use the software at vendor's expense; or replace or modify the software so that the software becomes noninfringing; or obtain substantially equivalent replacement software acceptable to the buyer.

These provisions are intended to provide practical solutions for a buyer in Smith's position. The vendor must provide full indemnification for damages sustained by the buyer as a result of its failure to meet warranty obligations or from any actual or claimed infringement by its product of intellectual property rights.

According to these provisions, even if an infringement has not actually occurred but the customer incurs costs in an effort to defeat an infringement claim, full indemnification is available. If the buyer is prevented from using the software, the vendor is required to take steps to assist the buyer to continue processing.

To obtain the full benefit of these provisions, IS buyers should cover two related issues in the contract: The forgoing provisions shall survive termination or expiration of this agreement for any reason; and they are not subject to or governed by any limitation of liability provision contained in this agreement.

As many reluctant litigants will testify, these important rights should explicitly survive termination of the relationship between the parties. An infringement action seeking damages, for example, may be filed even after the customer has ceased using the product. If the customer has retained the right to invoke the protections afforded by these provisions, it may then pursue a claim for indemnification against its former vendor.

In many instances, the vendor's form agreement will include a carefully drafted clause that limits the vendors' liability for malfunctioning software or other breach of the agreement. The vendor's liability will be limited to a specific dollar amount and the type of damages a customer can seek to recover will be restricted.

As a result, even if the agreement has appropriate language regarding ownership of the software and an indemnification clause, the vendor may convincingly argue that the scope of his obligation is limited. Any final agreement, therefore, should also include a statement that the vendor's obligation to provide compensation is not governed by the limitation of liability clause.

Hildebrand is an attorney and senior member of the High-Technology Group at Friedman Siegelbaum in Roseland, N.J.

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Cost Controls with On-Line Services
Executive Report
Close: *August 20*
26

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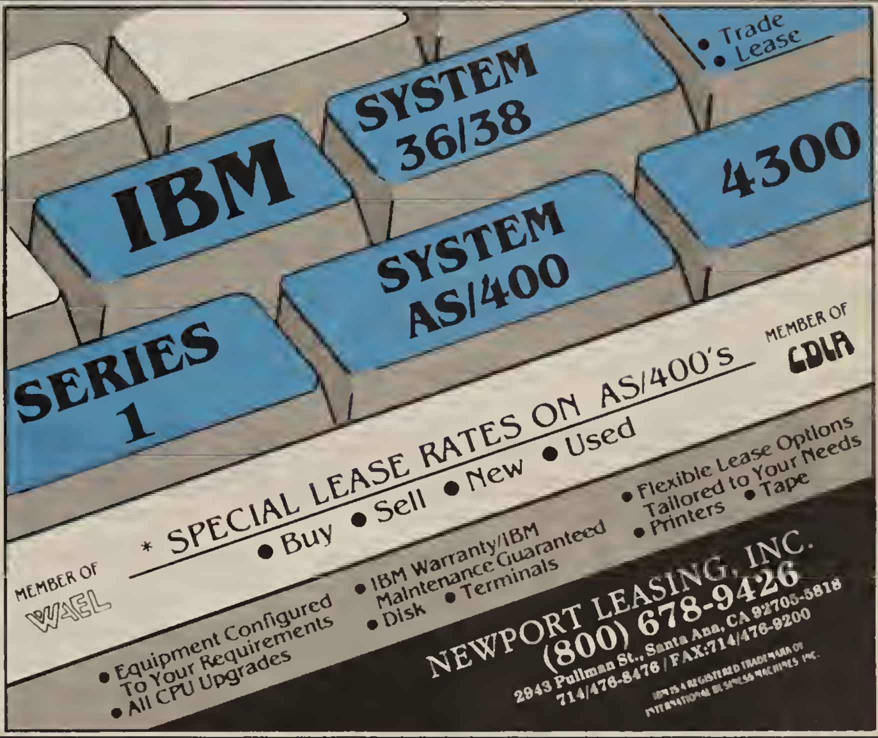

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The BoCoEx index on used computers

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	Closing price	Ask	Bid
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XT Model 089	$300	$450	$275
AT Model 099	$600	$675	$500
AT Model 239	$550	$650	$500
AT Model 339	$775	$1,000	$700
PS/2 Model 30-286	$1,000	$1,200	$900
PS/2 Model 60	$1,150	$1,500	$1,000
PS/2 Model 70P	$3,400	$3,600	$3,200
Compaq Portable II	$700	$1,050	$700
Portable 286	$1,100	$1,300	$1,000
Portable 386	$1,900	$2,100	$1,500
SLT 286	$1,700	$1,900	$1,550
LTE 286	$1,800	$1,900	$1,600
Deskpro 286	$800	$1,000	$700
Deskpro 386/20	$2,150	$3,000	$2,000
Apple Macintosh Plus	$750	$975	$700
SE	$1,100	$1,250	$1,050
IIX	$3,550	$3,600	$3,500
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RFP 2052, due Tues, 9/03/91 at 3:30 p.m. for a turnkey, LAN-based system for JONES COUNTY JUNIOR COLLEGE.

RFP 2053, due Tues, 9/03/91 at 3:30 p.m. for an IBM compatible PC-based geographic information system software for the MS STATE HIGHWAY DEPT.

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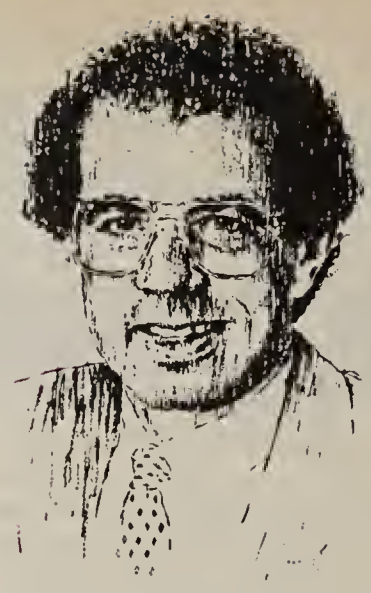

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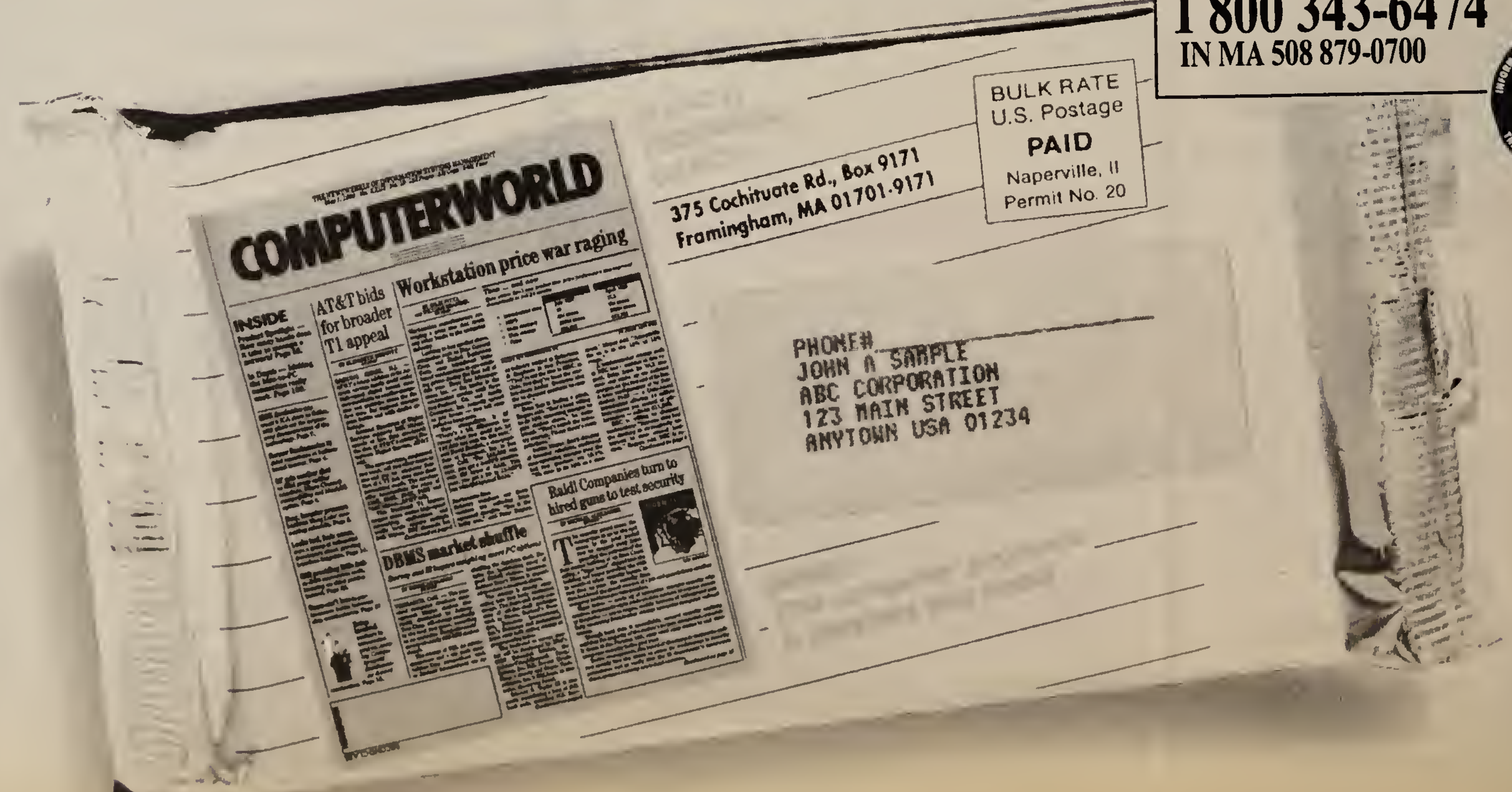
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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Centex Telemanagement, Inc.** (Alex. Brown & Sons, Inc.). The telecommunications service provider recently reported slightly less than expected earnings for its fiscal second quarter; growth rate on its high-line services has slowed, and gross margins have declined. Investor uncertainty will inhibit short-term stock performance.

UPGRADED FROM ATTRACTIVE TO BUY: **Microage, Inc.** (Mabon Securities Corp.). A significant amount of sales for the computer retailer came in from IBM, Apple Computer, Inc. and Compaq Computer Corp., which have responded to competition from second-tier personal computer makers by offering bigger discounts to traditional PC chains, including Microage. Most of Microage's franchises are healthy and are picking up corporate business as other PC retailers consolidate and cast uncertainty on their own futures.

UPGRADED FROM OUTPERFORM TO BUY: **Applied Materials, Inc.** (Shearson Lehman Brothers, Inc.). Applied Materials leads the market for plasma etch equipment, which will be used in advanced semiconductors next year; Taiwan is becoming a large contributor to the company's bottom line. The company's policy of investing in new technology during down cycles has consistently paid off during ensuing recoveries, which is likely to happen in the 1992-94 time period.

DOWNGRADED FROM BUY TO HOLD: **Control Data Corp.** (Bear, Stearns & Co.). Management at CDC recently said the company has seen no change in its sluggish business; selling off assets recently boosted the balance sheet, but continued soft economies in Europe and the U.S. will be tough to outrun in this year's second half.

NEW COVERAGE

INITIAL RATING OF HOLD: **Dell Computer Corp.** (Bear, Stearns). To recommend a stock in the PC sector, the firm must show earnings momentum from sales growth, stable margins and an attractive stock valuation. Dell meets all but the valuation criterion right now; its shares are trading too high to recommend purchase. However, it is a major factor in the PC industry and continues to develop sound new products.

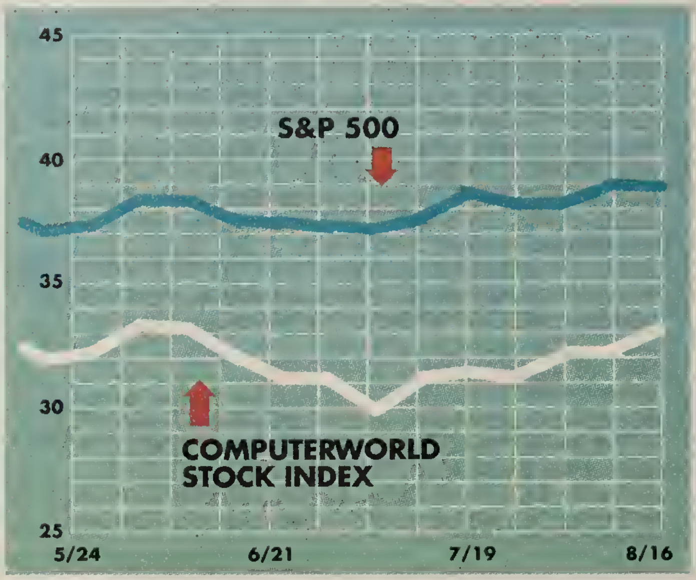
INITIAL RATING OF ATTRACTIVE: **Compression Labs, Inc.** (Paine Webber, Inc.). Compression Labs has the potential to become a $500 million company by the mid-1990s, even though sales last year were just $51.8 million. It is the market leader in videoconferencing equipment, a technology that many corporations are beginning to take seriously.

The market will probably be able to support both Compression Labs and chief competitor **Picturetel Corp.** Although video equipment from Compression Labs costs more than Picturetel's, Compression Labs' gear is of a higher quality because it uses a higher bandwidth for image transmission. Furthermore, prices for sending information over that bandwidth are dropping, so the rivals will be on a more equal footing.

For the past three years, Compression Labs has turned in sales growth of more than 55% and profit jumps of more than 200%. Its most recent financials showed revenue up 27% compared with the same quarter a year ago.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- New issue Sybase, Inc., a relational database maker, rocketed 4¼ points last week to 17¾ after an initial public offering Wednesday of 3.5 million shares priced at $13.50 each. Other software companies were mixed. Lotus Development Corp. shot up 3¾ points to 37¾, while Borland International, Inc. slipped ½ of a point to 49½.
- Chip maker Intel Corp. picked up ⅝ of a point to close Thursday at 49⅜. Western Digital Corp., which reported negative quarterly earnings last week, inched up ½ of a point to 4. Shearson Lehman Brothers, Inc. recently upgraded semiconductor stocks as a group from hold to buy, citing an approaching upward turn in chip makers' traditional business cycle.
- Wang Laboratories, Inc. won a patent infringement suit against two Japanese computer companies that reportedly could reap $12 million in royalty payments for the Lowell, Mass.-based firm. Wang Class B stock slipped ⅛ of a point, however, to 2⅞.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, AUGUST 16, 1991

TOP PERCENT GAINERS

On Line Software Int'l	55.26
Maxtor Corp.	39.99
Televideo Systems	33.45
Fibronix Int'l Inc.	27.91
Dataram Corp.	18.18

TOP PERCENT LOSERS

Intellicorp Inc.	-16.00
Cognitronics Corp.	-15.28
Apertus Technologies	-12.47
Ultimate Corp.	-11.11
Sequent Computer Sys.	-11.11

TOP DOLLAR GAINERS

On Line Software Int'l	5.25
Lotus Development	4.25
Aldus Corp.	2.88
Symantec Corp.	2.75
Compression Labs Inc.	2.63

TOP DOLLAR LOSERS

Adobe Systems Inc.	-5.25
Autodesk Inc.	-4.00
Matsushita Electronics	-3.50
Hewlett Packard Co.	-2.50
Digital Equipment Corp.	-2.38

Exch	52-Week	Range		Aug. 16 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 0.57%
OTC	13.13	5.38	3 COM Corp.	7.25	-0.13	-1.69
NYS	69.75	52.50	American Info Techs Corp.	60.75	0.63	1.04
NYS	40.38	29.00	AT&T	39.13	-0.38	-0.95
OTC	4.13	0.88	Artel Communication Corp.	2.00	0.00	0.00
NYS	56.25	39.50	Bell Atlantic Corp.	46.38	-1.25	-2.62
NYS	56.25	46.25	Bellsouth Corp.	47.38	0.50	1.07
NYS	52.25	13.25	Cabletron Systems	49.00	1.63	3.43
OTC	25.88	8.25	Compression Labs Inc.	22.88	2.63	12.96
OTC	5.13	2.44	Data Switch Corp.	2.75	0.13	4.76
NYS	21.50	8.88	Digital Comm. Assoc.	13.13	0.00	0.00
OTC	25.25	12.25	Dynatech Corp.	17.00	-0.25	-1.45
OTC	12.38	5.00	Fibronix Int'l Inc.	6.88	1.50	27.91
OTC	3.75	1.75	Gandalf Technologies Inc.	2.75	-0.25	-8.33
NYS	3.50	1.63	General Datacomm Inds.	2.50	-0.13	-4.76
NYS	33.50	23.50	GTE Corp.	29.25	-0.50	-1.68
NYS	63.00	40.25	ITT Corp.	58.63	-1.13	-1.88
OTC	35.00	17.88	MCI Commmunications Corp.	28.88	-0.25	-0.86
OTC	8.25	2.75	Microcom Inc.	7.50	0.25	3.45
NYS	12.38	4.00	Network Equipment Tech.	11.75	0.13	1.08
OTC	13.25	4.00	Network General	7.75	-0.50	-6.06
OTC	16.63	8.13	Network Systems Corp.	15.75	-0.63	-3.82
NYS	39.88	22.13	Northern Telecom Ltd.	38.13	0.63	1.67
OTC	62.25	17.25	Novell Inc.	60.88	0.00	0.00
NYS	77.50	67.00	Nynex Corp.	74.88	1.38	1.87
NYS	47.50	36.25	Pacific Telesis Group	42.00	-0.50	-1.18
OTC	11.63	3.63	Penril Data Comm. Ntwks.	7.75	-0.13	-1.59
NYS	24.50	8.88	Scientific Atlanta Inc.	13.88	-0.13	-0.89
NYS	57.50	47.25	Southwestern Bell Corp.	53.38	-1.63	-2.95
NYS	31.50	20.63	United Telecom	26.13	-0.25	-0.95
NYS	40.75	32.38	U S West Inc.	36.13	-0.13	-0.34
Computer Systems						Off 0.78%
OTC	20.75	4.50	Advanced Logic Research	13.75	0.25	1.85
ASE	17.88	10.00	Amdahl Corp.	13.38	-0.63	-4.46
OTC	73.25	24.25	Apple Computer Inc.	53.25	2.50	4.93
OTC	9.13	3.50	Archive Corp.	3.88	-0.25	-6.06
OTC	32.75	7.50	AST Research Inc.	28.00	0.13	0.45
NYS	9.38	4.00	Bolt, Beranek & Newman	7.00	-0.25	-3.45
NYS	21.63	4.50	Commodore Int'l	11.63	-0.38	-3.13
NYS	74.25	29.88	Compaq Computer Corp.	35.00	0.00	0.00
OTC	2.13	0.13	Computer Automation Inc.	1.38	0.00	0.00
NYS	14.38	6.75	Control Data Corp.	9.25	-0.63	-6.33
NYS	19.75	8.38	Convex Computer	11.00	0.38	3.53
NYS	44.50	20.00	Cray Research Inc.	41.00	1.00	2.50
NYS	19.38	3.50	Data General Corp.	17.75	0.25	1.43
NYS	3.25	0.75	Datapoint Corp.	1.38	0.00	0.00
OTC	33.50	8.25	Dell Computer Corp.	30.88	-1.38	-4.26
NYS	83.00	45.50	Digital Equipment Corp.	62.50	-2.38	-3.66
NYS	28.88	13.75	Harris Corp.	23.88	-0.13	-0.52
NYS	56.63	24.88	Hewlett Packard Co.	51.00	-2.50	-4.67
NYS	139.75	95.63	IBM	96.63	-2.25	-2.28
OTC	12.00	7.75	Information Int'l	10.00	0.75	8.11
OTC	31.50	10.50	Intergraph	19.75	-1.50	-7.06
NYS	149.00	114.00	Matsushita Electronics	117.50	-3.50	-2.89
OTC	19.00	9.00	Mentor Graphics Corp.	13.25	-0.25	-1.85
OTC	20.88	7.25	MIPS Computer Systems	12.13	0.63	5.43
NYS	109.50	44.50	NCR Corp.	108.75	0.25	0.23
OTC	29.50	10.75	Pyramid Technology	16.25	0.75	4.84
OTC	24.75	7.75	Sequent Computer Sys.	8.00	-1.00	-11.11
NYS	47.25	18.00	Silicon Graphics	38.75	1.25	3.33
NYS	39.13	14.63	Stratus Computer Inc.	37.25	-0.75	-1.97
OTC	38.63	15.00	Sun Microsystems Inc.	32.25	0.88	2.79
NYS	17.63	8.88	Tandem Computers Inc.	12.13	0.25	2.11
NYS	36.50	23.50	Tandy Corp.	25.38	-1.00	-3.79
OTC	23.13	6.75	Teradata	20.75	2.25	12.16
NYS	6.13	1.38	Ultimate Corp.	4.00	-0.50	-11.11
NYS	9.50	1.75	Unisys Corp.	4.63	0.13	2.78
ASE	5.75	2.00	Wang Labs Inc. (b)	2.88	-0.13	-4.17
Software & DP Services						Up 0.71%
OTC	63.00	17.00	Adobe Systems Inc.	52.50	-5.25	-9.09
OTC	12.25	3.50	Aicorp	4.38	0.25	6.06
OTC	59.88	20.25	Aldus Corp.	39.88	2.88	7.77
OTC	28.50	12.00	American Mgmt. Systems	19.00	-0.50	-2.56
OTC	17.25	7.50	American Software Inc.	12.50	1.75	16.28
NYS	4.63	1.38	Anacomp Inc.	3.25	-0.25	-7.14
OTC	18.25	10.00	Analysts Int'l	13.50	-0.25	-1.82
OTC	16.63	4.88	Ashton Tate	16.13	0.13	0.78
OTC	10.25	4.00	ASK Computer Sys.	9.13	0.13	1.39
NYS	37.00	22.63	Auto Data Processing	31.63	-1.63	-4.89
OTC	62.25	32.00	Autodesk Inc.	51.25	-4.00	-7.24
OTC	35.50	18.50	BGS Systems Inc.	32.50	-2.00	-5.80
OTC	49.00	17.75	BMC Software Inc.	49.00	2.00	4.26
OTC	16.25	8.75	Boole & Babbage Inc.	10.00	-0.38	-3.61
OTC	64.25	14.50	Borland Int'l	49.25	-0.50	-1.01
OTC	20.88	5.13	Cognos Inc.	16.00	0.13	0.79
NYS	11.13	4.38	Computer Associates	9.00	-0.13	-1.37
OTC	17.75	9.50	Computer Horizons	11.25	-0.63	-5.26
NYS	73.25	36.75	Computer Sciences	54.00	-1.50	-2.70
NYS	11.25	6.63	Computer Task Group	7.63	0.25	3.39
OTC	22.75	13.00	Comshare Inc.	20.00	1.00	5.26
OTC	13.25	3.75	Corporate Software	12.50	0.13	1.01
NYS	52.25	27.88	General Motors E (EDS)	49.75	-1.50	-2.93
OTC	18.75	7.25	Goal Systems Int'l	13.75	0.00	0.00
OTC	7.00	1.88	Hogan Systems Inc.	5.75	-0.25	-4.17
OTC	26.00	7.75	Information Resources	24.38	-1.00	-3.94
OTC	7.75	2.63	Informix Corp.	5.88	-0.63	-9.62
OTC	4.75	1.38	Intellicorp Inc.	2.63	-0.50	-16.00
OTC	8.25	2.50	Interleaf Inc.	5.75	0.50	9.52
OTC	12.25	6.88	Intersolv	9.25	0.00	0.00
OTC	43.25	10.00	Knowledgeware Inc.	28.13	1.63	6.13
OTC	45.00	16.75	Legent Corp.	23.50	1.00	4.44
OTC	37.25	12.50	Lotus Development	37.25	4.25	12.88
OTC	19.00	9.00	Mentor Graphics	13.25	-0.25	-1.85
OTC	32.00	10.25	Micrografx	11.63	0.38	3.33
OTC	83.75	33.88	Microsoft Corp.	81.75	1.00	1.24
NYS	14.75	4.00	On Line Software Int'l	14.75	5.25	55.26
OTC	15.13	4.88	Oracle Systems	9.88	-0.38	-3.66
NYS	13.25	7.00	Pansophic Systems	9.63	-0.13	-1.28
OTC	10.00	1.25	Phoenix Technologies	9.00	-0.13	-1.37
NYS	52.00	33.38	Policy Management Sys.	48.13	-1.25	-2.53
NYS	22.75	11.50	Reynolds & Reynolds	20.25	-0.25	-1.22
NYS	11.75	6.75	Ross Systems	9.75	-0.75	-7.14
OTC	27.25	14.75	SEI Corp.	24.50	-1.75	-6.67
OTC	22.88	13.00	Shared Medical Systems	21.00	-0.13	-0.59
OTC	35.25	12.00	Software Publishing Corp.	18.25	2.25	14.06
NYS	14.63	5.50	Sterling Software	13.00	0.25	1.96
OTC	19.75	9.50	Sungard Data Sys.	16.63	-0.25	-1.48
OTC	55.88	17.75	Symantec Corp.	54.25	2.75	5.34
NYS	11.75	4.50	System Center Inc.	8.13	-0.25	-2.99
OTC	37.25	12.50	System Software Assoc.	14.25	-0.25	-1.72
OTC	16.75	4.75	Weitek	7.00	-0.25	-3.45
Semiconductors						Up 0.02%
NYS	14.25	3.63	Advanced Micro Devices	11.13	0.00	0.00
NYS	12.50	5.50	Analog Devices Inc.	7.75	-0.25	-3.13
OTC	13.50	5.25	Chips & Technologies	7.63	-0.38	-4.69
OTC	59.25	28.00	Intel Corp.	47.75	-0.38	-0.78
NYS	12.50	5.13	LSI Logic Corp.	6.88	-0.25	-3.51
NYS	19.13	6.75	Micron Technology	12.63	-0.13	-0.98
OTC	20.88	7.25	MIPS Computer Systems	12.13	0.63	5.43
NYS	72.50	45.75	Motorola Inc.	66.75	1.88	2.89
NYS	8.38	3.00	National Semiconductor	5.50	-0.13	-2.22
NYS	47.63	22.50	Texas Instruments	31.25	-0.63	-1.96
OTC	12.25	3.00	VLSI Technology	6.38	-0.13	-1.92
ASE	10.38	3.13	Western Digital Corp.	3.75	0.38	11.11
Peripherals & Subsystems						Up 2.23%
OTC	2.75	0.88	Apertus Technologies	1.31	-0.19	-12.47
OTC	16.75	7.50	Banctec Inc.	12.50	-0.25	-1.96
OTC	17.50	4.25	Cambex Corp.	16.00	-0.50	-3.03
ASE	11.75	4.13	Cognitronics Corp.	7.63	-1.38	-15.28
NYS	31.25	14.63	Conner Peripherals	21.38	0.25	1.18
ASE	13.00	7.00	Dataram Corp.	13.00	2.00	18.18
NYS	13.00	4.25	EMC Corp.	7.63	1.13	17.31
NYS	47.25	33.75	Eastman Kodak Co.	43.00	2.38	5.85
OTC	11.25	4.75	Emulex Corp.	8.88	0.13	1.43
OTC	25.50	14.00	Evans & Sutherland	16.25	-1.50	-8.45
OTC	6.50	3.88	Iomega Corp.	4.88	-0.25	-4.88
OTC	28.25	6.75	IPL Systems Inc.	20.25	0.38	1.89
OTC	8.88	1.63	Maxtor Corp.	3.94	1.13	39.99
OTC	18.00	4.38	Micropolis Corp.	6.88	-0.63	-8.33
NYS	97.50	73.63	3M Corp	86.50	-0.63	-0.72
OTC	11.00	6.00	Printronix Inc.	6.75	-0.75	-10.00
NYS	24.75	8.50	QMS Inc.	22.50	0.25	1.12
OTC	18.25	8.25	Quantum Corp.	10.75	-0.13	-1.15
NYS	7.63	4.38	Recognition Equipment	6.88	0.13	1.85
OTC	11.50	4.00	Rexon Inc.	9.13	0.63	7.35
OTC	19.88	5.63	Seagate Technology	9.13	0.88	10.61
NYS	51.50	11.00	Storage Technology	45.00	-2.25	-4.76
OTC	4.75	1.25	Tandon Corp.	2.25	-0.25	-10.00
NYS	30.50	11.63	Tektronix Inc.	29.13	1.00	3.56
OTC	0.53	0.16	Televideo Systems	0.38	0.09	33.45
NYS	60.13	29.00	Xerox Corp.	55.00	-0.13	-0.23
Leasing Companies						Up 2.90%
OTC	16.25	7.00	Amplicon Inc.	14.75	0.00	0.00
NYS	28.38	14.63	Comdisco Inc.	20.63	-0.38	-1.79
OTC	14.63	8.88	LDI Corporation	12.75	0.25	2.00
OTC	4.50	2.25	Selecterm Inc.	4.00	0.50	14.29

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NEWS SHORTS

A victory for Microsoft, HP

Microsoft Corp. and Hewlett-Packard Co. scored a minor victory in their battle against Apple Computer, Inc.'s copyright suit last week when a federal judge reversed an earlier decision limiting the tactics they can use in their defense. The new order by U.S. District Judge Vaughn Walker allows Microsoft and HP attorneys to make the argument that because the Apple Macintosh includes features not wholly original to Apple, the work cannot be copyrighted.

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Writer probing Inslaw found dead

A Washington, D.C.-based writer probing the eight-year dispute between software developer Inslaw, Inc. and the U.S. Department of Justice was found dead in a hotel in Martinsville, W. Va., where friends said he had gone to meet with a source who had promised to give him important information about the case. Daniel Casolaro was found in a bathtub with his forearms slashed, and an apparent suicide note was discovered nearby. Friends of the writer said he had received warnings from sources that he was in danger as well as at least one death threat in conjunction with a book he was writing about the Justice Department's alleged theft of Inslaw's software and related crimes. An autopsy turned up no evidence of foul play in the writer's death.

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IBM brings out PCradio

IBM made its entree into the world of wireless computer communications last week. The IBM 9075 PCradio notebook computer, slated to be available in the fourth quarter, is specifically aimed at mobile sales and service applications and will be able to use radio links such as the Advanced Radio Data Information Services (ARDIS) network and cellular or conventional landline telephone networks. The ARDIS network was launched last year when Motorola, Inc. and IBM combined their radio frequency data communications networks using a packet data protocol.

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Bank banks on outsourcing

First American National Bank said it expects to save $40 million during the next 10 years by handing off responsibility for core banking applications to IBM's outsourcing subsidiary, Integration Systems Solutions Corp. (ISSC). The Nashville-based bank signed a pact with ISSC that calls for 150 information systems positions in the bank's data center operations, systems development and telecommunications departments to be transferred to ISSC. This is the first contract ISSC has signed to develop and maintain core banking applications.

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Gillette buys pen-based systems

Grid Systems Corp., a subsidiary of Tandy Corp., continues to be the only maker of pen-based systems delivering products. It received a commitment from The Gillette Co. last week for 300 Gridpads. Gillette said it plans to use the pen-based systems to get faster data turnaround from its field sales representatives.

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Wang wins one

A U.S. District Court jury last week ruled in favor of Wang Laboratories, Inc., which had filed patent infringement suits against NEC Corp. and Toshiba Corp. The Japanese firms and their U.S. subsidiaries were found guilty of selling single in-line memory modules that infringed on Wang's patents. Each company will have to pay Wang a royalty equal to between 2.75% and 4% of its sales of the infringing products between Jan. 1, 1990, and June 30, 1991, estimated to total $120 million. At a minimum, Wang stands to collect $3.3 million, a spokesman said. That number could jump as high as $8 million to $12 million if treble damages are awarded because NEC willfully infringed on Wang's patents. A spokesman for Wang said the judgments cleared the way for Wang to go after another 14 companies, including "almost every major U.S. semiconductor manufacturer," for similar infringements.

M&D founder targets desktop

BY NELL MARGOLIS
CW STAFF

WALTHAM, Mass. — After a year on the sidelines under a noncompete contract, software industry veteran Frank H. Dodge is back in the applications software game he once helped define.

Dodge's first entrepreneurial effort, McCormack & Dodge, rocketed into the top ranks of mainframe applications vendors during the 1980s. This time, he is moving to the desktop.

The Dodge Group, which is set to be introduced today, is developing a suite of business software applications specifically designed to meet the needs and exploit the potential of client/server computing.

Starting "from scratch, without the baggage of existing users tied to an outdated technology" will allow the start-up to move quickly and efficiently, Dodge said. In addition to Dodge, who will serve as chief executive officer and whose funds are bankrolling the firm's start-up stage, co-founders and executives include former M&D officials Bill FitzPatrick and Lori Henry and British software entrepreneurs John Linwood and Alan Hambrook.

The UK connection, U.S. development head FitzPatrick said, gives the start-up a dual advantage: an entry into the European market and a proving ground for the software, which is being engineered as multilingual.

Client/server-specific software "is going to be a vast market," Goldman, Sachs & Co. analyst Richard Sherlund said. Its rise, he explained, will be fueled by the convergence of two present realities. The first is that the "the economics of the client/server model are too compelling to resist." The second is that the economic benefits cannot be reaped without personal computer-based software "that is written from the ground up to take into account the powers and requirements of relational database systems, graphical user interfaces and processing across a network."

Dodge *is back in business with The Dodge Group*

The Dodge Group founders said their forthcoming products will be written in C, with a built-in graphical user interface and features fashioned to help users comply with global regulatory, tax and accounting standards. To fit the networked client/server model, the applications will be split from the beginning.

General ledger, accounts payable and accounts receivable packages are slated for 1992 availability on the IBM RISC System/6000 workstation. Purchase order and fixed asset management modules will follow, as will extensions to the Digital Equipment Corp. Ultrix platform and the Open Software Foundation's OSF/1, Dodge said.

Designed for eventual use with all major SQL relational databases, the initial release for the RS/6000 will operate with Ask Computer Systems, Inc.'s Ingres and Oracle Corp.'s Oracle.

Dodge could find his new company up against the remnants of his old: Dun & Bradstreet Software, corporate successor to M&D, is planning a client/server financial software entry this fall.

Lawsuit draws antitrust backlash

BY SALLY CUSACK
CW STAFF

ANAHEIM, Calif. — Digital Equipment Corp. spent the summer slapping firms with patent infringement lawsuits. Last week, one of them hit back.

Micro Technology, Inc., a $100 million company, contends in a federal court suit that DEC violated federal antitrust laws and willfully engaged in unfair business practices by unlawfully controlling the market for peripheral equipment.

Micro Technology produces storage subsystems, system software and networking products for DEC's VAX/VMS and Unix environments.

Steve Hamerslag, Micro Technology's chief executive officer, said DEC has taken the position that the only "good DEC customer is an all-DEC customer." Hamerslag added that the antitrust suit is meant to encourage DEC to give customers more freedom of choice.

"To embrace open systems, as they purport they are doing, they will have to open up the marketplace," Hamerslag said.

A DEC spokeswoman said the company "believes the suit is without substance or merit." She added that DEC will "vigorously" defend that position.

Robert P. Bigelow, an attorney and past president of the Computer Law Association, noted that antitrust suits are an almost standard defense in patent infringement cases.

CA bids for On-Line Software, citing products, customers

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. went back into the acquisition business last week, announcing that it will acquire Fort Lee, N.J.-based On-Line Software International, Inc.

The acquisition is still subject to approval from regulatory agencies and from both companies' boards and shareholders. "At this point, we have an agreement with their management," CA's Senior Vice President Sanjay Kumar said. The agreement is for $15.75 per share; On-Line stock, traded on the New York Stock Exchange, closed last Thursday at $10. Trading was suspended for much of last Friday pending the announcement.

Kumar said CA is interested in On-Line's products as well as its client base and consulting services. "They have great products," Kumar said. "And we'll also get a good client base and good employees."

He would not disclose which company first approached the other or for how long they have been in negotiations. "That will come out in the public documents we will file, but it's not appropriate to talk about at this point," he said.

Charles Phillips, an analyst at Soundview Financial Corp. in Stamford, Conn., said the acquisition will probably add to CA's revenue stream over the short term. But, he said, "On-Line is a slow-growth company, and I don't see where it does a lot for the long term. It's not something that a lot of people will get very excited about."

Ed Acly, an analyst at International Data Corp. in Framingham, Mass., said CA may be positioning itself for IBM's pending data warehouse announcement by gaining On-Line's Ramis fourth-generation language.

Developers get peek at improved Windows

BY JAMES DALY
CW STAFF

SEATTLE — Microsoft Corp. officials laid on the charm at last week's Windows 3.1 software developers' conference, unveiling a series of built-in diagnostic checks and balances in the impending update that they hope will lure developers into aggressively building applications optimized for the environment.

"We realized that unless we do our homework, we're not going to have developers writing robust applications for Windows," Cameron Myhrvold, manager of Microsoft's developer relations group, said during the two-day meeting.

Among the new features revealed to the nearly 2,000 attendees was Dr. Watson, a set of diagnostic tools designed to pinpoint the source of the persistent Unrecoverable Application Error crashes that have plagued many Windows 3.0 software packages.

Although Version 3.1, which is expected by the end of the year, will be compatible with most Version 3.0 applications and drivers, Microsoft officials have already indicated that there may be compatibility problems with certain components, such as memory managers.

Version 3.1 began shipping to beta-test sites several weeks ago and is reportedly incompatible with DOS-extender applications adhering to the DOS Protected Mode standard. Myhrvold said he expects that problem to be cleared up by the time Version 3.1 goes into general release.

Another prime area targeted by Microsoft engineers in creating 3.1 was greater applications integration, Myhrvold said. As a result, Version 3.1 will include Dynamic Data Exchange, Object Linking and Embedding and drag-and-drop features, a graphical icon-based component that simplifies application use.

Version 3.1 will also offer Common Dialogue, which contains a set of commonly used dialog boxes developers can call up and pop into their application, as well as an improved Help facility.

Software houses said the new features promise big payoffs in the development process. "Anything that can streamline the testing process and help us get the product out the door with fewer bugs is a great help," said Sheri Hargus, development manager at Aldus Corp.

On the end-user side, Version 3.1 will include the new font outline technology called Truetype, which was developed jointly by Microsoft and Apple Computer, Inc. as a way to break market leader Adobe Systems, Inc.'s stranglehold on outline-font technology.

Truetype will be incorporated directly into the Windows Graphics Device Interface, making the font available for all applications. The package will ship with at least a dozen standard Truetype fonts, Myhrvold said.

Version 3.1 will also address complaints about Version 3.0's file manager, which has to revert to DOS commands to perform a number of functions.

Users afloat

FROM PAGE 1

company is currently looking at Borland's Turbo Pascal for Windows, among other tools.

For the same reason, Microsoft's Visual Basic is also attracting attention. Both Savas and Art Block, vice president and chief technology officer at Evernet Systems, Inc., said they are interested in the product. Block's firm currently uses Microsoft C and the Windows SDK for most development projects. However, he said, Visual Basic, which is being used for prototyping, looks as if it might be robust enough to be used for production applications — something he has not found with other higher level applications generators.

Large companies such as Borland and Microsoft are not providing the only tool options, however. Jay Weiss, a senior consultant at General Electric Consulting Services, said "application builder" tools such as Forest and Trees for Windows from Channel Computing, Inc. and Easel from Easel Corp. are finding many uses both internally and with clients. "You've got to turn a project around fast in most cases," he said.

Speed was also an issue for John Wyman, who has been using Guidance Technologies, Inc.'s Choreographer tool for 1½ years at a large telecommunications company.

Wyman said the product was extremely versatile. "It did everything the other [applications] could do and more," he said.

Choreographer was originally an OS/2 product, but Wyman said the recently released Windows version is also being used.

Windows&OS/2®
CONFERENCE

Cornucopia of tools

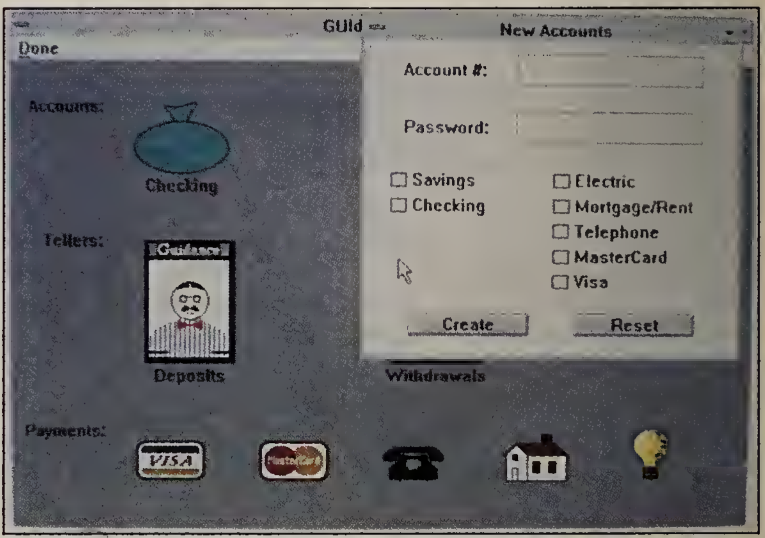
Windows users are finding an abundance of development aids

A selection of Windows development tools:

Product	Company	Price
Toolbook	Asymetrix Corp.	$395
Windowsmaker Professional	Blue Sky Software Corp.	$995
Smalltalk/V for Windows	Digitalk	$500
Enfin/2 Windows	Enfin Software Corp.	$2,500
Guild Version 1.1	Expert-Ease Systems, Inc.	$1,995
GFA Basic for Windows	GFA Software Technologies, Inc.	$495
Knowledgepro Windows	Knowledge Garden, Inc.	$549
Object/1	MDBS, Inc.	$995
VZ Programmer	VZ Corp.	$595
Realizer	Within Technologies, Inc.	$395

CW Chart: Janell Genovese

Putting a graphical face on things



Guidance Technologies' Choreographer 2.0 *allows applications to take on point-and-click features*

Symantec buys Zortech

CUPERTINO, Calif. — Software developer Symantec Corp. announced last week that it has purchased Zortech, Inc., a maker of cross-platform C++ compilers, for approximately $10 million in stock.

The acquisition moves Symantec one step closer to its goal of providing a wider selection of cross-platform C++ development environments for corporate developers, company President Gordon E. Eubanks said.

Symantec currently offers a series of languages for the Apple Computer, Inc. Macintosh environment as well as a line of applications and systems software products for both IBM and Apple personal computers.

Eubanks added that Symantec ultimately plans to integrate Zortech's multiplatform technology into its own product line. Woburn, Mass.-based Zortech now offers C++ compilers for DOS, OS/2, Unix, Microsoft Corp.'s Windows and Macintosh platforms.

Symantec also announced the release of Zortech C++ Version 3.0, a powerful C++ development package for DOS, Windows and OS/2. The update is available immediately and retails for $399.95.

JAMES DALY

Bank merger

FROM PAGE 1

to be hit the hardest because San Francisco-based Bank of America already has significant data center capacity on Security Pacific's home turf.

Also in doubt is the service bureau business of SPAC, which handles processing for outside customers as well as Security Pacific's internal IS.

"Bank of America looks at this acquisition as a big opportunity to be the first truly nationwide bank," said Frank Petro, vice president and manager at the San Francisco office of IS consultancy CSC Index, Inc. "I would think they would see SPAC as a distraction to that goal." Petro added that it should not be hard to find a buyer for the service bureau business.

The merger, which is subject to regulatory and shareholder approval, will create a banking giant with assets of $190 million. The new Bank of America will be second only to Citicorp among U.S. banks and even larger than the Manufacturers Hanover Corp./Chemical Banking Corp. combination announced earlier this summer.

Depending on how successfully operations are combined, Bank of America could emerge as an IS powerhouse. It is already considered very strong in demand deposit and retail banking systems and was recently honored with a Society for Information Management Partners in Leadership Award for its Customer On-line Information Network [CW, Aug. 5]. Security Pacific is considered a bank industry leader in some imaging and neural network applications.

Both banks are large IBM mainframe shops, a fact that should make some integration of systems easier. Michael Heschel, who headed SPAC last year and is now group vice president of IS at The Kroger Co. in Cincinnati, said the two banks have some cultural similarities despite their business rivalry.

"They are both large regional banks with similar philosophies," Heschel said. "There is less cultural difference than we had to overcome with American and Baxter."

Heschel was the top IS executive at American Hospital Supply Corp. and stayed on after it was acquired by Baxter International, Inc. in the mid-1980s.

One area that will need to be resolved, Heschel noted, is SPAC's check and image processing, which reports to Security Pacific's operations function. At Bank of America, that back-office processing reports to IS.

The Southern California IS job market, already glutted from First Interstate Bancorp's data center consolidations and defense industry cutbacks, will likely receive another influx of job seekers.

Bank of America runs a large data center in downtown Los Angeles, while Security Pacific has large processing operations in the suburbs of Brea and Glendale that may be ripe for consolidation.

"Cost will drive those decisions," said M. Victor Janulaitis, president of Los Angeles IS consulting firm Positive Support Review, Inc. "Most of their savings will come from people. The real downside is that it's not a very favorable job market for anyone right now in Southern California."

Both banks have aggressively acquired smaller banks and thrifts throughout the West, and the IS job cuts will be felt in many states. The combined bank will be the largest in Washington and Arizona.

Antivirus vendors form consortium

BY MICHAEL ALEXANDER
CW STAFF

Antivirus software vendors are quick to tout how many of the computer critters their products are capable of spotting and eradicating. With estimates of the number of viruses on the loose ranging from 400 to 1,000, some antivirus software vendors are finding a lot to crow about in their advertising.

Now, six of the largest antivirus software vendors and the National Computer Security Association (NCSA) say it is time to tone down the marketing hype.

The gross number of viruses a product can pinpoint is immaterial, said Robert Bales, executive director of the NCSA. "There are only 48 to 50 [viruses] that have ever attacked anything in real life," he said.

The vast majority of reported viruses are self-destructive, do not replicate, are inoperable or are confined to research laboratories, Bales said. In fact, many so-called viruses fail to meet the definition of a virus, which in simple terms is a piece of code that relies on a program to run and is able to replicate.

Standing as one

The NCSA and the software sellers — McAfee Associates, Central Point Software, Inc., Xtree Co., Microcom, Inc., Symantec/Peter Norton Products Group and Certus International — are collaborating on establishing an antivirus product developers' consortium that would create a code of ethics, among other things.

The consortium also plans to establish standards for identifying and classifying viruses, increase public awareness of the virus problem and lobby for antivirus legislation.

The group is slated to host an antivirus product developers' conference in Washington, D.C., on Nov. 25 and 26.

"What is needed most is a standard for judging performance" of antivirus software, said John McAfee, president of McAfee Associates and chairman of the Computer Virus Industry Association in Santa Clara, Calif.

Members of the consortium said that establishing standards will enable end users to better evaluate antivirus software.

Ongoing problem

The problems caused by viruses are expected to continue to escalate, according to several experts. "The volcano is rumbling, but no one is paying attention," said A. Padgett Peterson, a member of the professional staff and a computer virus expert at Martin Marietta Missiles and Electronics Group, a division of Martin Marietta Corp. in Orlando, Fla. Computer viruses of the future will be more professionally written and more destructive than they are now, he said.

Of immediate concern is a lack of antivirus software that adequately protects local-area networks, Peterson said. He is responsible for protecting, among other systems, more than 5,000 personal computers and 200 minicomputers at Martin Marietta.

Peterson said that no single antivirus software package can do an adequate job of protecting computer systems. He advocated using two or three antivirus products that regularly scan for malicious code as well as sound an alarm whenever a file has been inexplicably altered.

Even with the best precautions, computer viruses continue to infiltrate the company's systems. Not long ago, three-quarters of the 2,000 PCs on a LAN were knocked out by a virus, Peterson said.

Two of the most common sources of infection are software demonstration disks and driver disks that accompany hardware.

TI adds desktop features to Travelmate

Move seen as a major step for the company toward notebook/office hybrid

BY MICHAEL FITZGERALD
CW STAFF

Notebook computers have been touted as possible replacements for desktop computers, but they have been handicapped by a lack of certain basic functions.

Today, Texas Instruments, Inc. is expected to take a step toward greater desktop functionality by introducing several attachments for its Travelmate 3000 notebook, a 5.7-pound computer based on Intel Corp.'s 80386SX chip.

TI will call its box the Travelmate 3000 WinSX because Microsoft Corp.'s Windows 3.0 is bundled with it. TI has souped up its screen, providing greater clarity. It has also added power management and other utilities and has made its Travelpoint trackball mouse standard.

Available as options are an expansion station with three bays and three add-in slots, a 9.6K bit/sec. modem, an Ethernet adapter and a small computer systems interface (SCSI) adapter that will support up to seven peripherals.

Analysts said TI would be the first to offer these kinds of attachments, differentiating itself slightly in a "me-too" market. But the new offering's appeal will be limited, they added.

"They're stepping out ahead of the time frame," said Andrew Seybold, personal computer analyst at Dataquest, Inc. in San Jose, Calif. Seybold said more than 90% of all notebooks are still used as second machines. He said TI was probably 12 to 18 months ahead of the market for this type of notebook but added, "That's not all bad. They might push the market."

Analysts agreed that the machine's $4,499 price tag will not attract a lot of buyers. The price does not include the add-ons. The SCSI adapter costs $399; the Ethernet adapter, $499; the modem, $899; and the expansion station, $999.

"Price will limit it to a specific market: super power users," said George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

Analysts pointed out that TI is not the first portable computer maker to offer networkability.

Grid Systems Corp., a subsidiary of Tandy Corp., provides some of the same abilities with its 1450SX laptop, according to several analysts.

Road warrior

Texas Instruments, Inc.'s new laptop has an optional 9.6K bit/sec. modem, small computer systems interface adapter and Ethernet card

TM3000 WinSX

Processor: Intel Corp. 80386SX-based, 20 MHz
Memory: 4M bytes of RAM
Storage: 60M-byte hard drive
Software: MS-DOS 5.0, Micrasaft Corp.'s Windaws 3.0
Display: IBM Videa Graphics Array display
Weight: 5.7 paunds

Source: Texas Instruments

CW Chart: Janell Genovese

IBM router

FROM PAGE 1

confirmed that the router family will be based on the company's RISC System/6000 platform and will be homegrown. IBM also said that the first release will, at a minimum, route Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM's own Systems Network Architecture (SNA) and Netbios communications protocols.

Industry observers said they saw IBM's uncharacteristic release of advance product information as a way to prevent users poised to make multiprotocol router purchases from turning to vendors already shipping.

"IBM is threatened by the companies that already route TCP/IP because those guys are also coming up with ways to route SNA," said Bill Conley, manager of information technology services at Loral Aerospace Corp. Loral is a mixed-protocol shop that uses equipment from router market-share leader Cisco Systems, Inc.

"If IBM doesn't stop these guys, they'll take over SNA routing for them," he said.

About one-third of the Fortune 1,000 companies do not yet have routers installed, according to Forrester Research, Inc., a consultancy in Cambridge, Mass. Therefore, last week's move could "stall the market" while users wait for IBM, Janet L. Hyland, Forrester's director of network strategy research, said. "IBM is not yet late with the router — unless the product is a big raspberry when it comes out," she said. Forrester tags the U.S. router market at $156 million in 1990, growing to an estimated $565 million by 1994.

The waiting game

Large SNA users said they are willing to wait, but not indefinitely. "If IBM doesn't deliver for nine or 12 months, that's a long time for us," said Robin Layland, engineering consultant at The Travelers Corp. in Hartford, Conn. Layland said the firm is looking to install routers at least by the first half of next year. If IBM's timing is right, he said, he will seriously consider the vendor "because of the billion-dollar strength behind it, compared with a small company."

Layland added that he interprets the IBM router as a sign that "the backbone of the future may be in TCP/IP and OSI. Most corporations are starting to use LANs and PCs, and those are not SNA-based."

Routing of Novell, Inc.'s IPX/SPX, Apple Computer, Inc.'s Appletalk, Digital Equipment Corp.'s Decnet, Xerox's Network Services and Open Systems Interconnect's protocols is on deck, IBM said. IBM's Fjeld said the firm will look to outside protocol routing expertise where needed, but he quashed rumors that the firm would implement another vendor's routing code.

IPX/SPX and Appletalk might make it into the first product release, IBM said, but it would not commit to that support.

The firm did commit, however, to a Simple Network Management Protocol (SNMP) agent in the first release. This will require another layer of network management to link SNMP to IBM's Netview enterprise network manager. That "layer" is expected to be a derivative of Hewlett-Packard Co.'s Openview, a Unix-based graphical enterprise manager. IBM and HP have teamed on a proposal to the Open Software Foundation for an industry-standard distributed management environment.

"The message here is that SNA shops will have to learn more than Netview; we're going to have to start understanding the SNMP environment, too," Layland said.

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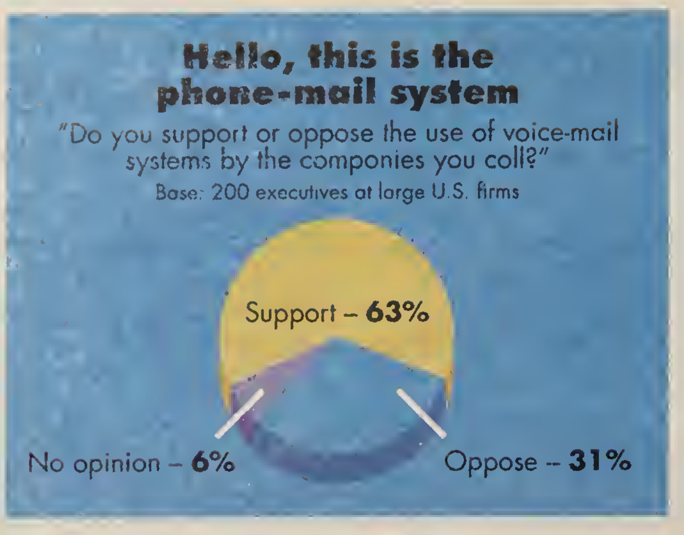


Hello, this is the phone-mail system

"Do you support or oppose the use of voice-mail systems by the companies you call?"

Base: 200 executives at large U.S. firms

Match game

Match these IS chiefs with their majors in college

George F. (Rick) Adam Partner Goldman, Sachs & Co.	**B.S., Mathematics**
James Sutter VP and general manager Rockwell International Corp.	**B.S., Marketing**
John Ullrick VP, MIS Playboy Enterprises, Inc.	**B.S., Engineering**
James Marston CIO and President American President Systems	**B.A., Political Science**
Robert Fetten Director of information processing The Metropolitan Opera	**B.S., Finance**

• Adam – B.S., Engineering • Sutter – B.S., Finance • Ullrick – B.S., Marketing
• Marston – B.A., Political Science • Fetten – B.S., Mathematics

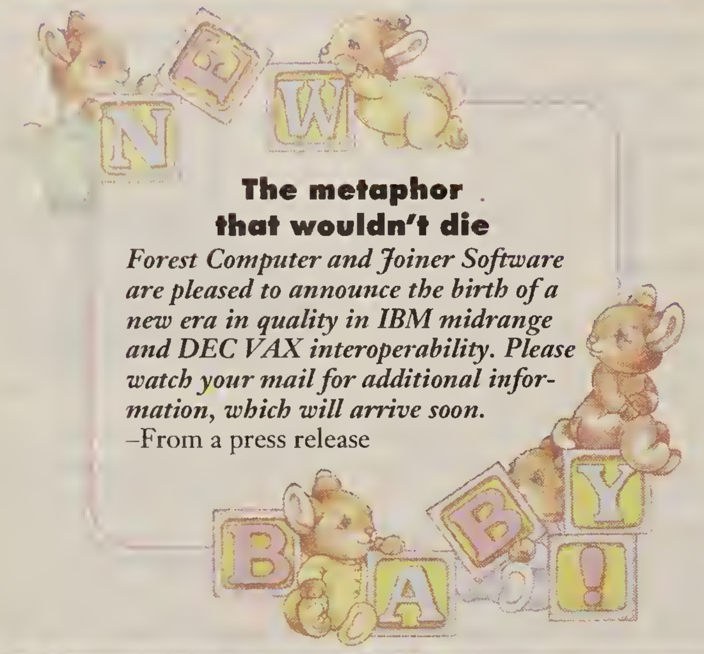
HACKERSPEAK

Hacker slang and jargon from *The New Hacker's Dictionary:*

crufty adj. Poorly built, possibly overly complex. Example: "This is standard old crufty DEC software." n. A small crufty object; often one that doesn't fit well into the scheme of things. "A LISP property list is a good place to store crufties."

face time n. Time spent interacting with somebody face-to-face as opposed to electronic links. "Yeah, I spent some face time with him at the last Usenix."

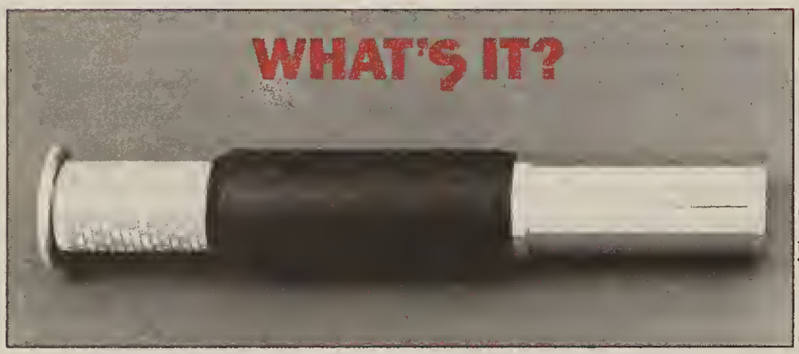
YABA n. Yet Another Bloody Acronym. Whenever some program is being named, someone invariably suggests it be given a name that is acronymic. The response from those with a trace of originality is to remark ironically that the proposed name would then be "YABA-compatible." Also used in response to questions such as "What is WYSIWYG?" "YABA."



The metaphor that wouldn't die

Forest Computer and Joiner Software are pleased to announce the birth of a new era in quality in IBM midrange and DEC VAX interoperability. Please watch your mail for additional information, which will arrive soon.

–From a press release



Courtesy of The Computer Museum, Boston

1. 1960 Harley-Davidson handgrip
2. One of Frankenstein's neck bolts
3. An early 1920s pocket-size cylindrical slide rule "calculator" manufactured by Carbic Ltd. in London

FUN FACT

The Chinese did their national census with an abacus until 1982, when they replaced the abacus with computers

Minor presence

There are few minorities or women in the computer science education field in the U.S., with the number of blacks lagging furthest behind*

• Total number of computer science professors**	**2,702**
• Number of female professors of computer science	**243**
• Number of Hispanic professors of computer science	**35**
• Number of black professors of computer science	**20**
• Total number of computer science Ph.D.s awarded in 1989	**907**
• Number of Asians awarded Ph.D.s in computer science in 1989	**281**
• Number of blacks awarded Ph.D.s in computer science in 1989	**4**

* Including computer engineering. ** Assistant, associate and full professors

▶ Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: *The New Hacker's Dictionary* (September 1991, The MIT Press); Computing Research Association's 1990 Taulbee Survey of North American academia; Accountemps; Special thanks to The Computer Museum, Boston.

INSIDE LINES

Still working on the innards

▶ Compaq definitely has four new Deskpros and two new Systempros, all upgradable to accommodate faster chips, headed for market in mid-October. The question is, what will be inside them? Right now, Compaq has Intel 80386SX and DX chips inside four low-priced Deskpros and two premium-priced towers based on single Intel I486 processors, one running at 25 MHz, another at 33 MHz. The towers will be billed as low-end Systempros, even though they won't support the Systempro disk arrays, and are aimed at IBM's hot-selling Personal System/2 Model 95. Observers say Compaq may also announce its high-end Systempros, one a dual-processor tower based on 33-MHz 486 chips and one a four- to six-processor tower based on the same. Sources say Compaq may announce that these will be upgradable to Intel's dual-speed 33-MHz/66-MHz 486 (customers say Compaq is promising free upgrades) and eventually to the full 66-MHz chip. The key for both product families centers on when Intel announces the chips and whether it cuts prices on the 486SX.

We're legit. Honest.

▶ The Software Publishers Association (SPA) is planning to raid "a Route 128 technology company" just outside of Boston this week, according to Ken Wasch, the SPA's executive director. Wasch kept the name of the company secret, saying only that it is "medium-size, not too big." The SPA, which he said has filed 100 lawsuits alleging software copyright violations since its inception two years ago, got the tip-off about this week's target from the SPA piracy hot line. More than 95% of SPA's cases are hatched when disgruntled current and former employees tattle on their bosses, Wasch said.

If you Window, it will come

▶ The wait for 1-2-3 for Windows has winnowed down to days, according to Lotus. One spokeswoman confirmed last week that product delivery is imminent, while another said it will probably happen this week or next. Ironically, rival Microsoft, which already has a Windows spreadsheet on the market, is expecting the long-awaited arrival of 1-2-3 for Windows to boost sales of Windows applications. Bill Gates has said this repeatedly, most recently in his PC Expo keynote address. Some industry estimates place sales of the Windows environment at twice that of Windows applications, blamed in part on the absence of key products such as 1-2-3, Borland's Quattro Pro, Wordperfect's word processor and Software Publishing's Harvard Graphics. The latter three are all in beta testing.

But wait! There's more.

▶ Feedback from the Wordperfect beta-test front has been positive. In fact, one user who took a look at the product said they were so pleasantly surprised that they decided to wait rather than switch. The company was on the verge of standardizing on a competing product before it saw Wordperfect's version of windows word processing.

Besides, it's too hot to merge

▶ Nervous McDonnell Douglas Systems Integration employees got the word from company President John Mazzola last week, and the word was a big "maybe." No, their company has not been sold to Electronic Data Systems, the General Motors subsidiary and outsourcing giant, Mazzola said. However, he confirmed that merger discussions have been ongoing between EDS and McDonnell Douglas Systems Integration for the past 10 months and could gel into a done deal at any point — or never.

The August issue of Armed Forces Journal International *reports that the Pentagon is circulating a draft directive that calls for embedding a virus or some other form of malicious software in every major new U.S. weapons system. The idea is that if the weapon was to fall into enemy hands, the virus could be remotely triggered to disable the weapon. We think having an army of 14-year-old Nintendo addicts operate the U.S. defensive missile system would be more effective. If you have any thoughts on the subject or news tips to share, call Assistant News Editor Jim Connolly at (800) 343-6474, fax them to (508) 875-8931 or Compuserve us at 76537,2413.*

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